

AMERICAN
JOURNAL OF PUBLIC HEALTH
and
THE NATION'S HEALTH

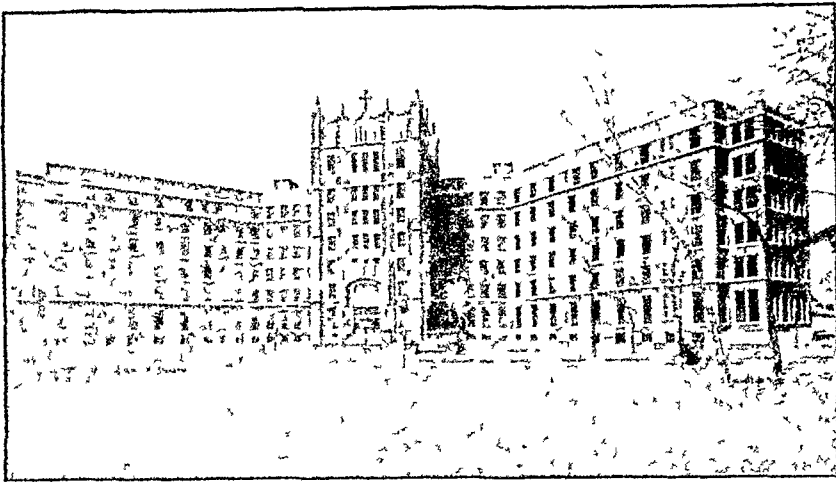
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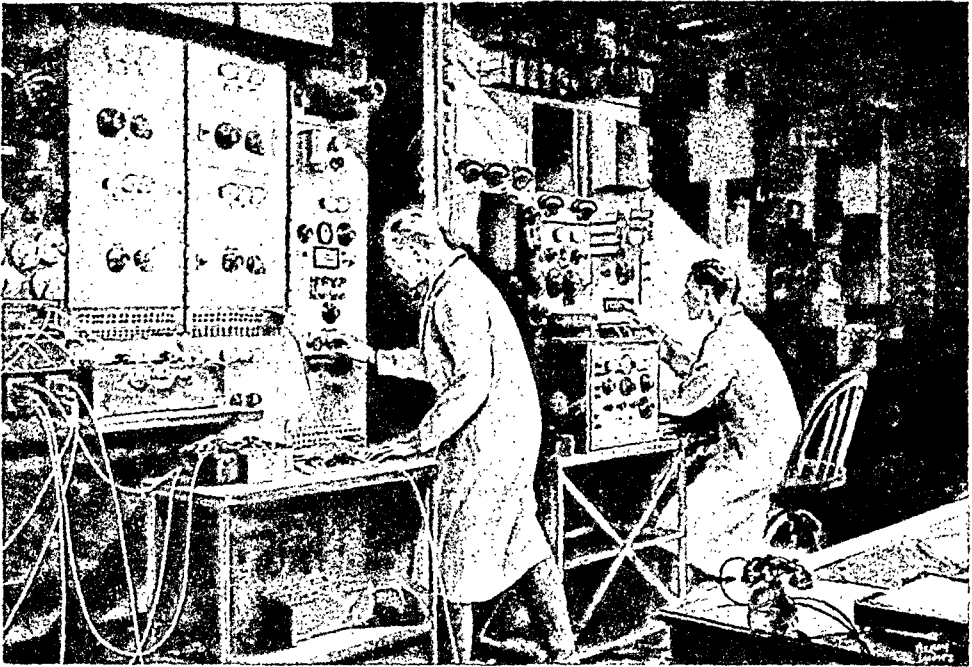
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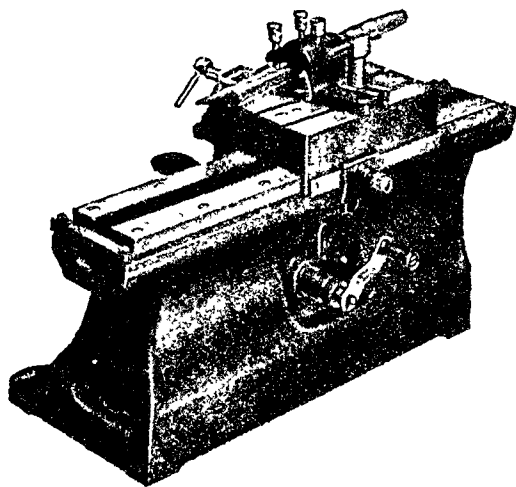
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Published by the American Public Health Association, Prince and Lemon Sts., Lancaster, Pa., and
370 Seventh Avenue, New York, N. Y.

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Address correspondence regarding editorial contents and manuscripts to the Editor in Chief, M. P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, 370 Seventh Avenue, New York, N. Y.

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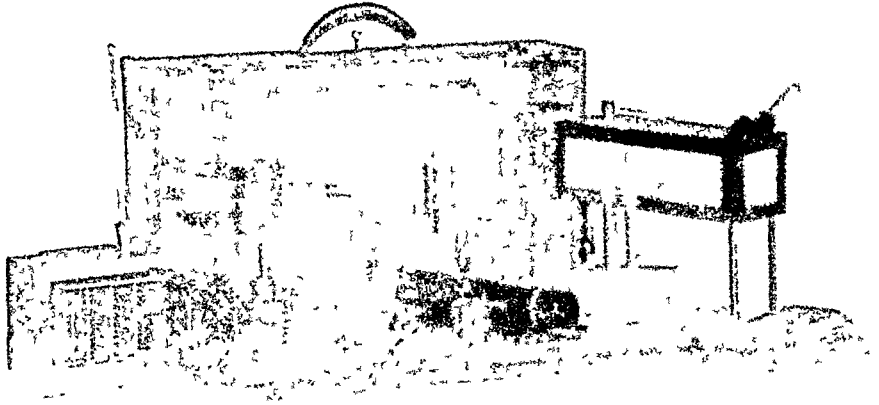
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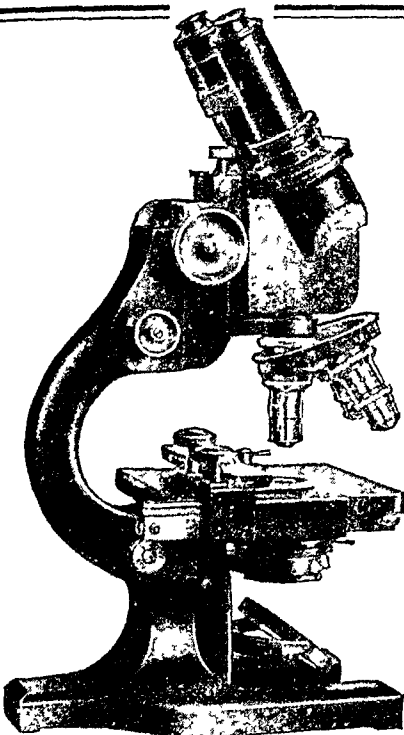
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450 Seventh Avenue, New York, N. Y.

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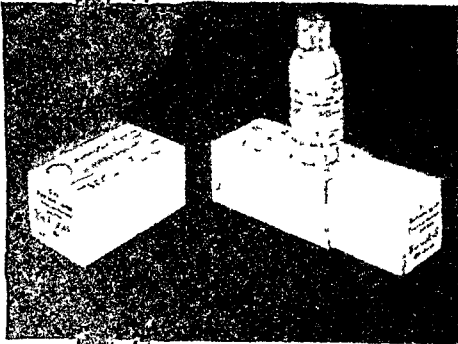
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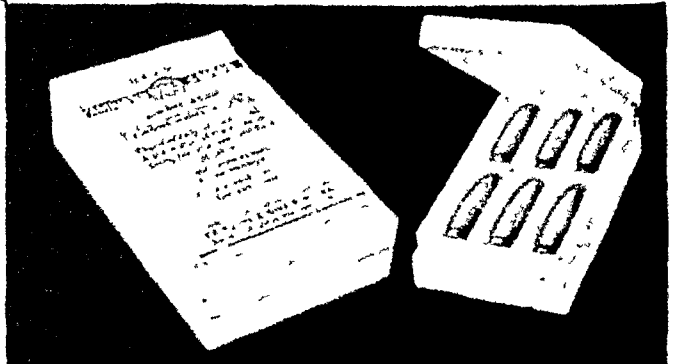
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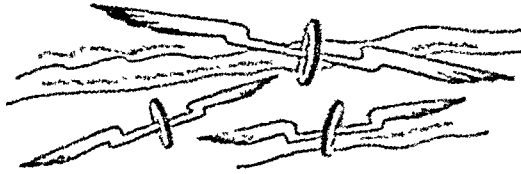
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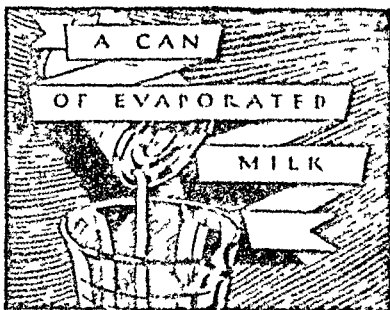
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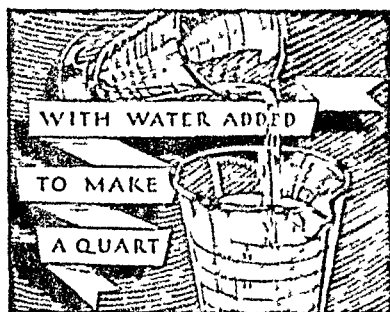
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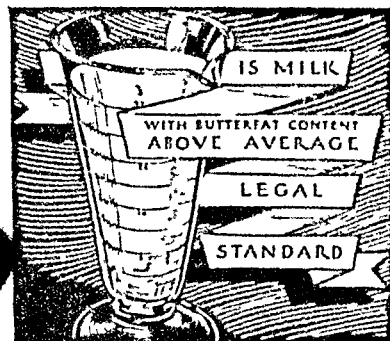
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Published by the American Public Health Association, Prince and Lemon Sts., Lancaster, Pa., and 450 Seventh Avenue, New York, N. Y.

NOTICE:—Subscription \$5.00 per year for United States and possessions; \$5.50 for Canada and \$6.00 for other foreign countries. Single copies, 50 cents postpaid. Copyright, 1931, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to the Editor in Chief, M. P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, Prince and Lemon Sts., Lancaster, Pa., or 450 Seventh Avenue, New York, N. Y.

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Further details in relation to this subject are set forth in a pamphlet entitled, "The Feeding of Infants in Diarrhea", and in our book, "Formulas for Infant Feeding". This literature will be sent to physicians upon request.

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Mellin's Food Company, Boston, Massachusetts

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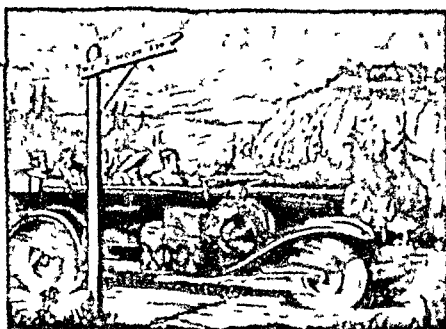
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The milk supply for summer

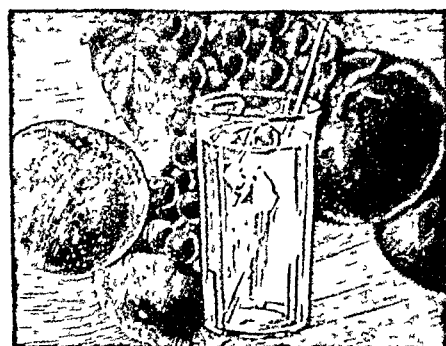
When there's question about the milk supply in the summer time, consider how Evaporated Milk will help in any of the following circumstances:



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3 When children's appetites are dulled by the hot weather, delicious milk-drinks can be made with Evaporated Milk and fruit juices. The milk blends perfectly with any of the fruit juices—tomato, orange, or grape, fresh or canned or bottled—to make wonderfully refreshing drinks. They'll tempt and stimulate the appetite. They're good for everybody.

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American Journal of Public Health

and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

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September, 1931

Number 9

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Published by the American Public Health Association, Prince and Lemon Sts., Lancaster, Pa., and
450 Seventh Avenue, New York, N. Y.

NOTICE:—Subscription \$5.00 per year for United States and possessions; \$5.50 for Canada and \$6.00 for other foreign countries. Single copies, 50 cents postpaid. Copyright, 1931, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to the Editor in Chief, M. P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, Prince and Lemon Sts., Lancaster, Pa., or 450 Seventh Avenue, New York, N. Y.

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Accepted!

Now let this seal be your guide
to abundant Vitamin B



INVESTIGATIONS in chronic vitamin B deficiencies have stressed the importance of constantly restoring this important element to the body. This is especially true of growing children; and it is also exceedingly valuable to the diets of pregnant or nursing mothers because of the undoubted salutary effect of a sufficiency of vitamin B on lactation.

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The following mixture is recommended as a temporary diet in intestinal disturbances of infants commonly spoken of as summer diarrhea:

MELLIN'S FOOD 4 level tablespoonfuls
WATER (boiled, then cooled) 16 fluidounces

Weight in grams of food elements in each ounce of the above mixture:

PROTEINS	0.176 Grams
MALTOSE	1.002 Grams
DEXTRINS	0.352 Grams
SALTS	0.073 Grams

Summer Diarrhea

Individual conditions will guide the physician in regard to the amount to be given at each feeding and the intervals of feeding, and naturally the intake per day will be thus influenced. Assuming, however, that the above-stated amount (16 fluidounces) is administered during the full twenty-four hours, the actual daily intake of food elements would be as follows:

PROTEINS	2.82 Grams
CARBOHYDRATES { Maltose 16.03 Grams }	21.66 Grams
{ Dextrins 5.63 Grams }	
SALTS	1.17 Grams

This gives a total of 25.65 grams of nourishment that is readily digestible and available for immediate assimilation. The mixture also contributes 101 Calories for the generation of heat and energy.

The above accurate examination of the quantity and quality of food elements in the suggested mixture is set forth in order that physicians may determine to their own satisfaction the value of this means of replenishing elements withdrawn from the infant's organism as one of the results of frequent bowel movements.

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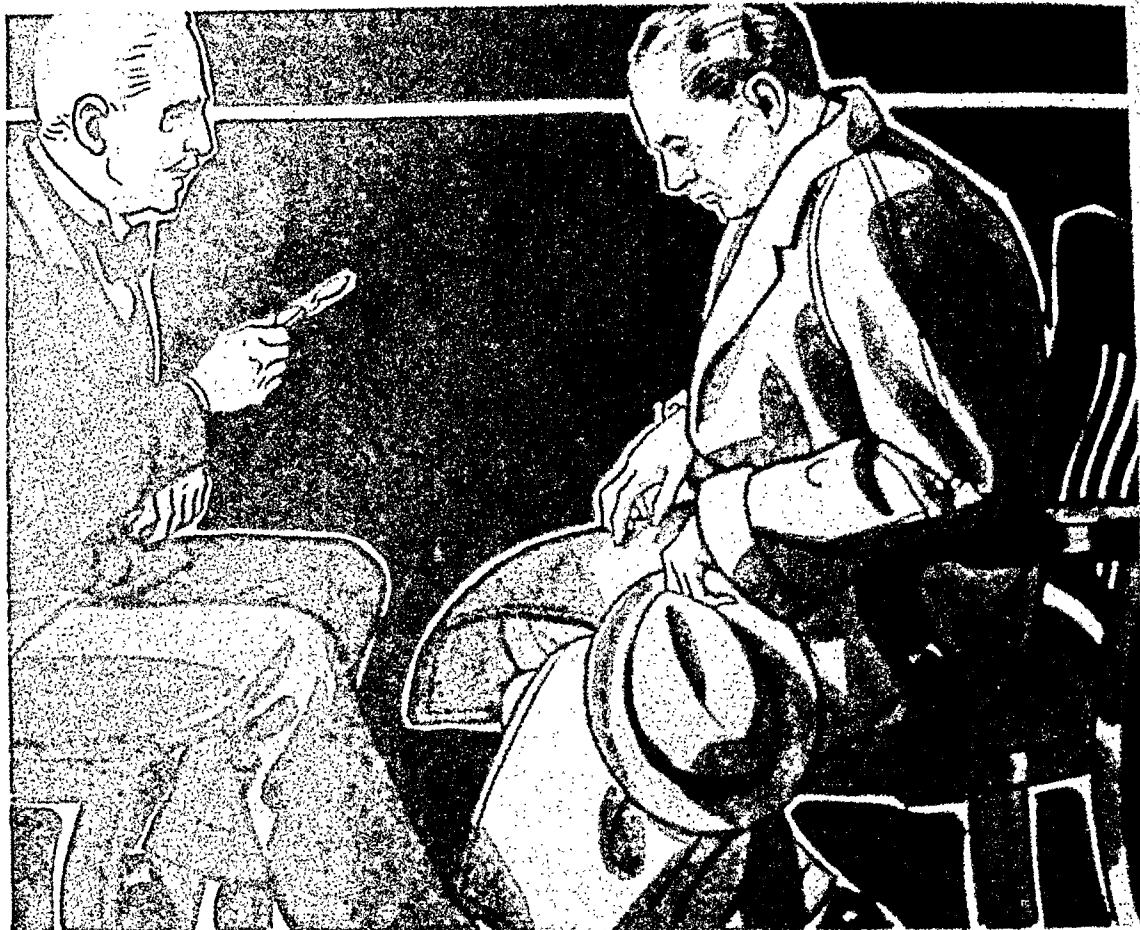
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Partial Vitamin B Deficiencies Are More Prevalent Than Is Commonly Supposed...



WORKERS in nutritional research, McCollum, Hoobler, Sure, Cowgill, Sherman and Eddy, among others, have noted a definite relation between a lack of sufficient vitamin B in the diet and such common conditions as loss of appetite, malnutrition and impaired assimilation of food, retardation of growth and development, derangements of gastro-intestinal function (including constipation), and general impairment of physical condition and resistance to disease.

Few foods are really rich in this necessary vitamin; examination of the ordinary diet shows it often present in but small amount. The very frequent improvement in health which follows the addition of vitamin-B-rich foods, in both infants and adults, is corroboratory evidence that "run down" conditions, constipation, and other chronic gastro-intestinal disorders are often attributable to a chronic *partial* deficiency of vitamin B.

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American Journal of Public Health
and THE NATION'S HEALTH

Official Monthly Publication of the American Public Health Association

Volume XXI

November, 1931

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Published by the American Public Health Association, Prince and Lemon Sts., Lancaster, Pa., and
450 Seventh Avenue, New York, N. Y.

NOTICE:—Subscription \$5.00 per year for United States and possessions; \$5.50 for Canada and \$6.00 for other foreign countries. Single copies, 50 cents postpaid. Copyright, 1931, by American Public Health Association.

Address correspondence regarding editorial contents and manuscripts to the Editor in Chief, M. P. Ravenel, M.D., University of Missouri, Columbia, Mo.

Address correspondence regarding subscriptions, advertising, reprints, etc., to American Public Health Association, Prince and Lemon Sts., Lancaster, Pa., or 450 Seventh Avenue, New York, N. Y.

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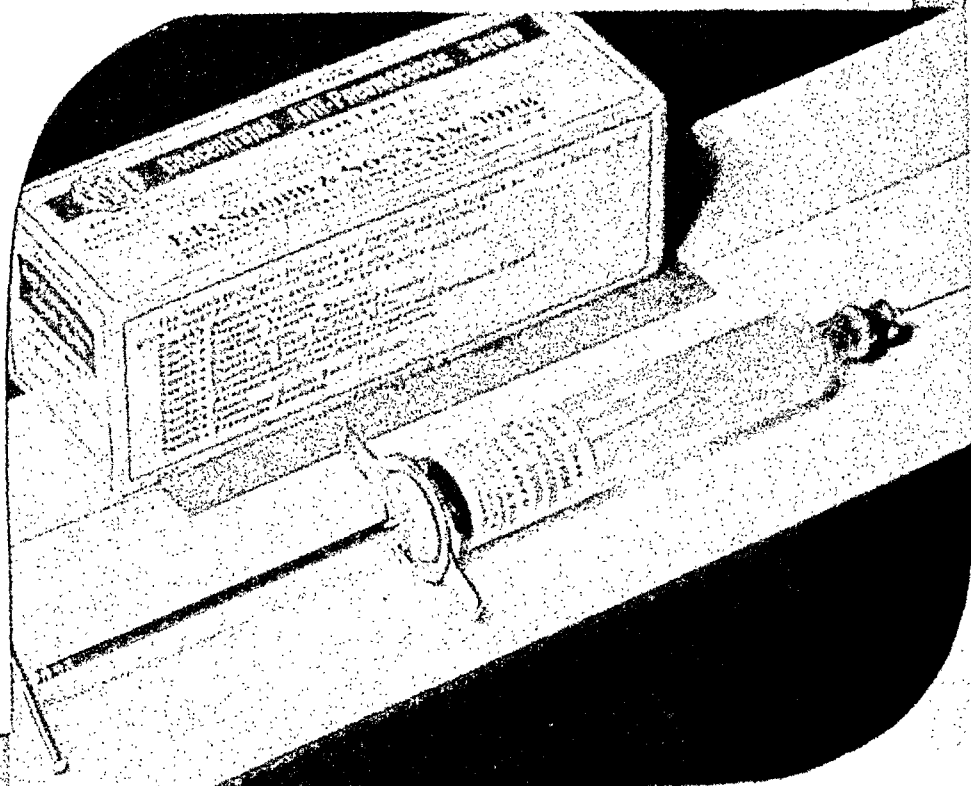
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American Journal of Public Health

and THE NATION'S HEALTH Vol. XIII No. 1

Volume XXI

January, 1931

Number 1

The International Hygiene Exhibition

GEORGE C. DUNHAM, M. D., DR. P. H., F. A. P. H. A.*

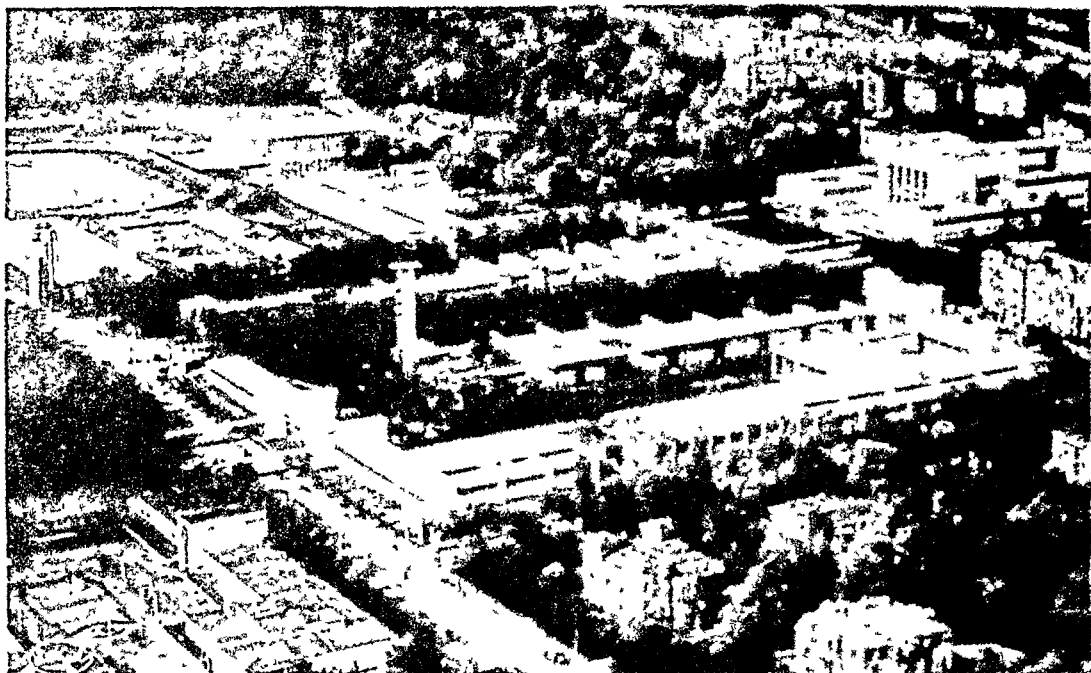
Medical Field Service School, Carlisle Barracks, Pa.

THE year 1911 witnessed a unique experiment in health publicity—the first International Hygiene Exhibition in Dresden, Germany. So successful was this exhibit in stimulating interest in health matters that its founders and sponsors conceived the idea that the work so auspiciously begun should be continued by a museum devoted to the instruction of the general public in the conservation of health. As a result, the German Hygiene Museum of Dresden was started in 1912 and, despite the vicissitudes of the World War and the years of reconstruction and rehabilitation which followed, development was continued to completion in 1930. In order that the opening of the new museum might be celebrated in a fitting manner, the second International Hygiene Exhibition was held in Dresden from May to October, 1930.

Dresden has, during the years since the World War, presented a series of annual exhibitions, mostly of an industrial nature. These are not "trade fairs" in the same sense as are many European exhibitions, but are of a cultural nature and designed to depict the progress being made in the industry or profession in question. They are supported financially by the city of Dresden, which is obligated to make good any losses which may be incurred. Grounds with halls are also provided by the city.

The 1930 International Hygiene Exhibition could be roughly divided into two parts, consisting (1) of the exhibits in the halls and on the grounds, and (2) the German Hygiene Museum. The former were temporary and were removed when the exhibition closed. The German Hygiene Museum is a permanent institution and was not

* United States delegate and Army representative at the International Hygiene Exhibition, Dresden, Germany.



View of the Exhibition Grounds

affected by the closing of the exhibition. As the museum is located immediately adjacent to the exhibition grounds there was no physical separation between it and the temporary exhibits on the exhibition grounds proper. Exclusive of the museum, the exhibition grounds comprised some 350,000 square meters of area with about 35,000 square meters of roofed hall space. The museum has 22,000 square meters of useful floor space.

The first and most important purpose of the exhibition was to afford instruction in health matters for the general public by exemplifying and demonstrating methods of conserving and promoting both individual and community health. It was also designed to show the progress that has been and is being made in health practice, not only in Germany but throughout the world.

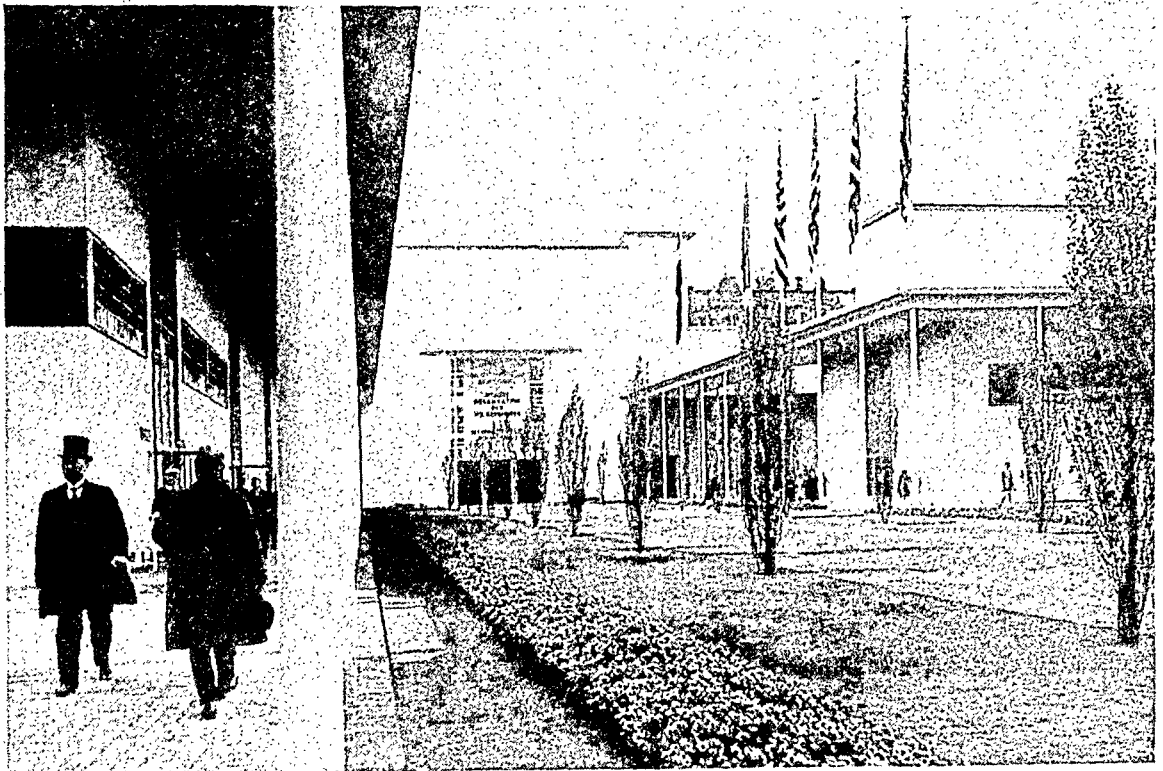
There were two classes of exhibits—scientific and industrial. The former were supported and extended by the latter and each industrial exhibit was closely connected with and supplemented the scientific exhibits on the particular health feature concerned, the industrial part being subordinated to the scientific aspects. In many cases, however, the industrial portion of an exhibit was in itself of great instructional value.

The scientific exhibits can best be considered grouped into three principal sections. One, the international section, was comprised of exhibits by most of the nations of the world; another consisted of exhibits contributed by various health agencies of Germany, includ-

ing the national government, states, and cities, and societies or associations concerned with health work; the German Hygiene Museum constituted the third.

The international exhibits were housed in a large building known as the "Place of Nations," within which halls were allotted to the various participating nations, among which were France, Great Britain, Austria, Russia, Turkey, Roumania, Switzerland, Czechoslovakia, Jugoslavia, Italy, Holland, Norway, Sweden, Denmark, Danzig Free State, Latvia, Chile, Argentina, Mexico, and Japan. The League of Nations, the Red Cross, and the German Evangelical Missions also had exhibits. The United States was represented only by the exhibits of two commercial firms.

The exhibits varied greatly in character and scope. Some were quite elaborate and extensive, while others consisted only of a few charts and pictures, but each was instructive, and represented a worth while effort. Practically every exhibit showed the incidence of various diseases in the country represented, especially the most prevalent. In most instances some consideration was given the control measures practised. The more extensive exhibits included material dealing with child hygiene, maternal hygiene, industrial sanitation, school sanitation, sports and physical culture, and the control of infectious diseases. Some considered special activities, such as the manufacture



Part of the Place of Nations, showing the hall allotted to the United States

and use of biologicals, the construction of sanatoriums, etc. Others contained special features, such as the health car equipped for epidemiological work which formed a part of the Czechoslovakian exhibit. Models, photographs, placards, drawings and charts were generally utilized.

While the exhibits in the international section generally covered practically all phases of health activities, the greatest emphasis was placed on child hygiene among both the preschool and school children and on industrial hygiene and sanitation. It was quite evident that the nations of the world considered the protection of the child and the industrial worker of paramount importance.

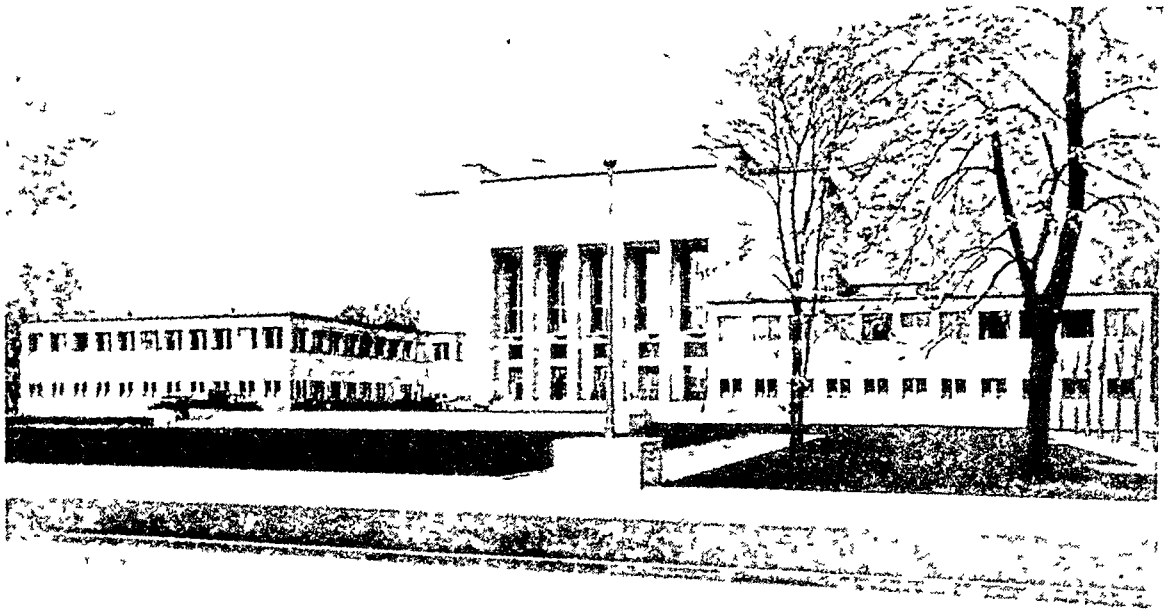
The exhibits of the national government and the states and cities of Germany dealt with practically every phase of preventive medicine, but were primarily intended to depict the present status of health work and the progress being made in the various fields. As the national government as well as each contributing state and city was represented by a separate exhibit, there was some duplication, though each presented distinctive features. A great deal of attention was given to child hygiene, industrial hygiene and sanitation, physical culture and sports, maternal hygiene and community sanitation.

Of the exhibits shown by the German states, those of Saxony and Prussia were the most elaborate. In addition to the usual subjects, the Saxony exhibit considered in some detail the care and education of the blind and crippled, the development of physical culture and sports, the use of labor saving devices, and home sanitation. The Prussian exhibit also presented material pertaining to municipal sanitation and included models of water works, sewage disposal plants, swimming pools, etc. The nature and scope of the work performed by the Robert Koch Institute was shown by means of charts and drawings.

The cities of Bremen and Hamburg contributed excellent exhibits. These contained particularly interesting features pertaining to port sanitation, models of sailors' homes and rooming houses, the control of rats and other rodents, and dock construction. Methods of food control, abattoir construction, and the inspection of food products, were demonstrated by models and pictures.

THE GERMAN HYGIENE MUSEUM

This proved to be the most interesting part of the exhibition, at least for the American visitor. It should be understood that it is not a museum in the ordinary sense but is in reality a teaching institution for giving health instruction to the general public. It has been con-

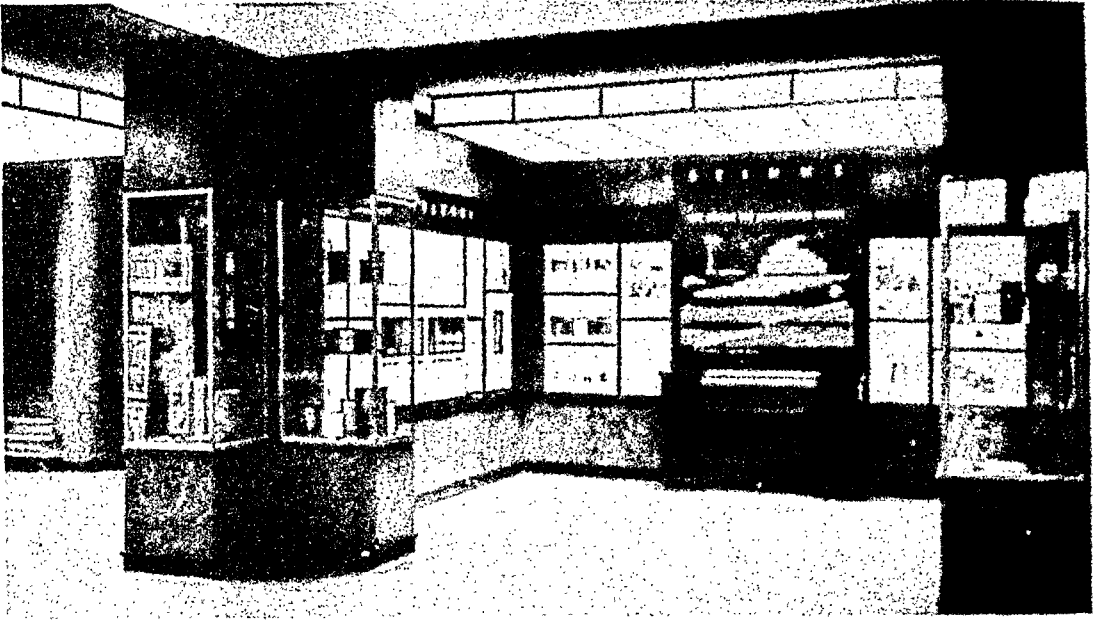


The German Hygiene Museum

ceived and developed as a central academy of public health. Its sole mission is to bring to the attention of the average person the need for protecting and promoting his health, and to teach the basic principles of health conservation. All exhibits have been arranged with a view to accomplishing this by methods which require the minimum of initiative and effort. In each instance the material has been prepared and arranged with a view to attracting and holding the attention of the casual visitor. Each exhibit is designed to teach a definite and simple lesson and the dominant health feature so emphasized as to force it upon the attention. The exhibits consist of models, apparatus, placards, paintings or drawings. Wherever practicable, moving apparatus, or apparatus with which the observer can perform experiments for himself, is utilized.

Generally, the exhibits on the first floor of the museum pertain principally to anatomy and physiology. The objective is to demonstrate the normal structure and functions of the body and, to a certain extent, the effect which abnormalities or violation of health rules have on the normal structure and functions. Transparent life size models are used to show the location and relations of the bones, blood vessels, nerves, muscles and viscera. Some of these can be lighted to accentuate the part or parts demonstrated. For example, one such model can be lighted so that the cranial, thoracic, abdominal, and pelvic viscera are successively and alternately thrown into bold relief.

Moving models are used, where practicable, to demonstrate the functions of the body, such as models of the joints which can be caused to execute the various movements of which they are capable. An-



*Part of exhibit dealing with hearing. Note instrument used to elicit the various sounds.
(German Hygiene Museum)*

other shows by means of a moving light the pathway of an involuntary reflex motion (patellar reflex). Others are used to demonstrate the mechanism of the heart and its valves, the maintenance of the blood pressure, the movements of the structures of the mouth and throat involved in speech, etc. All or any of these can be operated by the

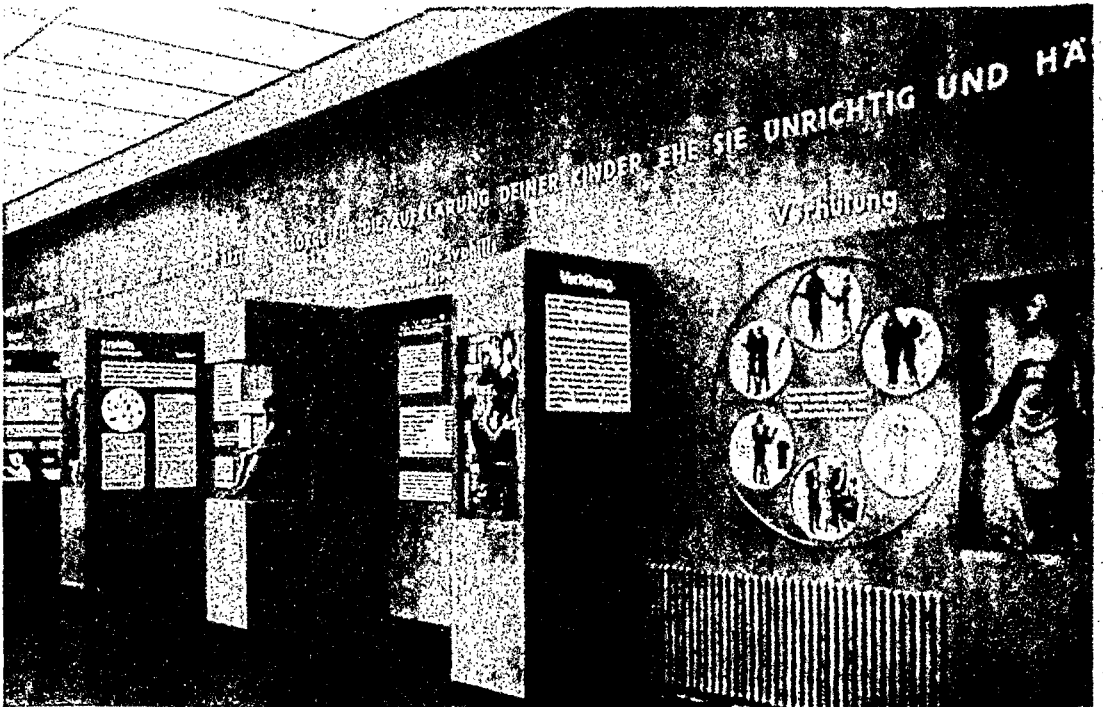


Exhibit dealing with venereal diseases. (German Hygiene Museum)

visitor and thus serve not only to attract his attention but also to make an impression upon his memory.

Many pictures and placards are used to show the structure and functions of the body.

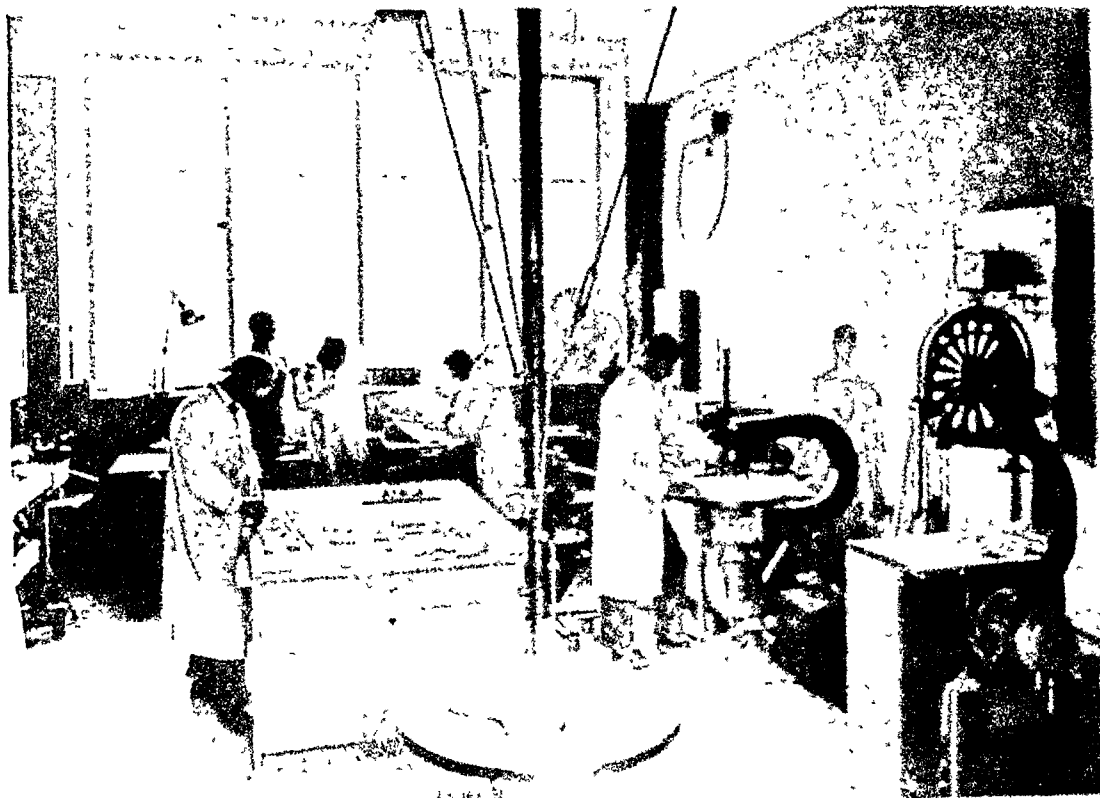
On the second and third floors of the museum are a number of exhibits, the more important of which are concerned with eugenics, food, care of the mother and child, and the control of the preventable diseases. Models, apparatus, placards, etc., are used in much the same manner as in the exhibits on anatomy and physiology. Skeletons and specimens are used to show the evolution of man from the lower forms of animal life and to demonstrate the different stages of development of the human body.

One exhibit demonstrates the mechanism of childbirth and delivery by life size models and manikins, and the measures which must be taken to prevent infection during childbirth. The hygiene of nursing and methods to protect the health of the breast fed infant and nursing mother are demonstrated by means of models and pictures.

The food or nutritional exhibit is one of the best. All phases of the process of digestion are illustrated by means of models, anatomic specimens, drawings and pictures. The value of each article of food in common use is shown in terms of its constituents. Models of the different products are exhibited which can only with difficulty be differentiated from the real. The amount of food required over a period of time is demonstrated by showing full size models of the actual quantity consumed. Thus, the quantity of potatoes consumed by one person during one year is shown by models of the potatoes. The methods of protecting food and controlling food-borne diseases are shown. The cause, prevention and treatment of the various food deficiency diseases are demonstrated by models and pictures.

There are exhibits which pertain directly to the control of the infectious diseases. While these are less extensive than those discussed above, they are well prepared and presented. That on tuberculosis, for example, consists of models and pictures which graphically demonstrate the avenues of transmission, the methods of prevention and treatment, and prevalence charts for Germany. The exhibit on the pathology, prevention and treatment of cancer is exceptionally good.

The museum also includes well equipped workshops in which the models, apparatus, placards, drawings, and lantern slides used in making up exhibits and in giving instruction are made. These shops employ about 100 persons, including artists, mechanics and other skilled workmen. Much of the product is at present being sold to other museums, schools and institutions engaged in teaching health.



Part of Museum workshops

The German Hygiene Museum is staffed and equipped to give short courses in health subjects to teachers, physicians, students, mothers, and various other classes of the general public. The permanent teaching staff consists of about 6 instructors, which is supplemented by specialists from the outside who give instruction on specific subjects. The instruction consists of lectures and demonstrations. The equipment includes well appointed lecture rooms and the models and other exhibits of the museum. Lantern slides are extensively used. The teaching facilities are extended to other communities in Germany by traveling exhibits and teaching personnel.

Nearly all parts of Germany have been reached by the traveling exhibitions. A specially constructed motor truck is used to transport the exhibits and personnel to isolated villages and rural sections. It carries a large tent to house the exhibition and is equipped with an electric lighting unit.

The German Hygiene Museum has shown its exhibits or held organized exhibitions in a number of foreign countries, notably Austria, Switzerland, Hungary, and Czechoslovakia. Exhibits have also been sold to foreign museums.

The International Hygiene Exhibition included certain miscellane-

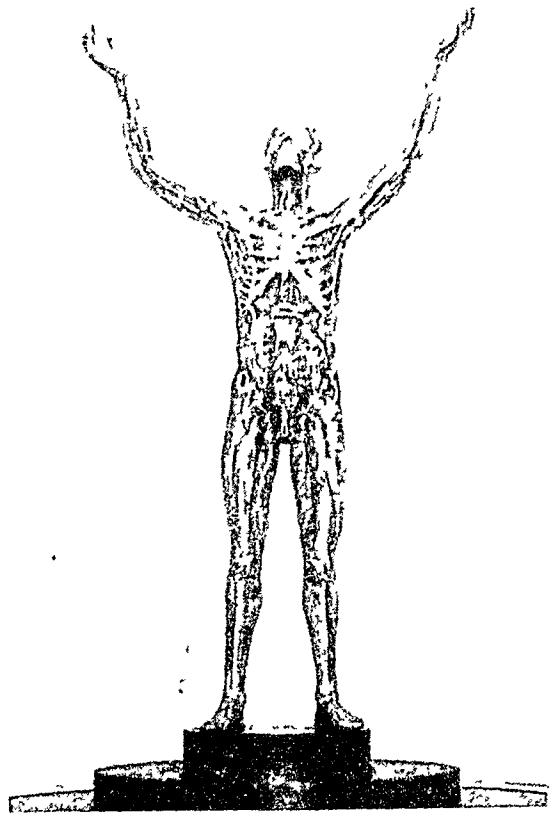
ous exhibits more or less directly concerned with health conservation. Among these was a hospital exhibit, a model farm, and a model home. The first was housed in a separate building and was designed to demonstrate the functions of a hospital and to show the value of the hospital in the maintenance of health. All the various parts and sections of a modern hospital were shown: clinics, operating rooms, wards, laboratories, etc. Much of the equipment was arranged just as it would be in a functioning institution.

The model farm was installed in an adjacent park. It included a farm house and other farm buildings and was stocked with all of the usual animals, showing the approved arrangement of farm facilities and methods of caring for live stock. It included a building in which models, pictures and specimens were shown depicting the cause, transmission, control and treatment of the diseases of animals.

The model homes exhibit consisted of a number of buildings of different sizes, each of which was furnished and equipped as a home, demonstrating the approved methods of construction, of installing plumbing, of lighting and ventilating.

Despite unfavorable weather, about one and one-half million persons were admitted between the opening date and August 1. The general admission fee was 2 marks (48 cents).

The exhibition as a whole did not include anything that was original from a scientific viewpoint. It did, however, offer the trained health worker much food for thought in the field of health publicity. It was everywhere evident that a great deal of study and labor had been devoted to attracting and holding the attention of the visitor and thus developing the salient health lesson of each exhibit or group of exhibits. The museum is, moreover, of special interest to American health workers from the viewpoint of health



Transparent man showing the location of the viscera. This model is automatically lighted to show the location and relations of the various organs. (German Hygiene Museum)

publicity. The character of the museum exhibits and their arrangement indicate that a thorough study had been made of the psychology of the average museum visitor. Every exhibit has been prepared and arranged with all the thoroughness and ingenuity so characteristic of the German workers. Wherever practicable, advantage was taken of the tendency of the average person to visit a museum for the purpose of being entertained rather than instructed. The entire museum is in fact a valuable demonstration of methods of health publicity, and is well worthy of study by any health officer. Certainly, anyone engaged in public health work who visits Germany should visit the German Hygiene Museum.

Effect of Methanol Anti-Freeze on Health

SURGEON GENERAL H. S. CUMMING of the U. S. Public Health Service, when asked regarding the statement issued December 6 by the Bureau of Mines on the effect of methanol anti-freeze on health, stated that the Service had kept in touch with the observations being made by the Bureau of Mines on the subject, and that he felt there was need for the immediate release of information which would protect the general public. It appeared from the study so far that there was much more danger from exhaust gas (carbon-monoxide) than could possibly come from methanol when used strictly as an anti-freeze liquid in automobiles.

The greatest danger is that some one might drink methanol, especially in view of its being used in place of ordinary denatured alcohol as an anti-freeze, and in view of its other name, methyl alcohol. Methanol when taken internally is more certainly poisonous and more highly fatal than any denatured alcohol. According to press accounts, such poisoning has recently occurred in Pennsylvania.

Another danger is in the use of methanol in shellacs which might be applied over considerable surfaces without adequate ventilation. The presence of the coloring matter as recommended by the Bureau of Mines, and the addition of 23 per cent water as at present dispensed, guard anti-freeze methanol against such dangerous use.

A complete study is advisable as to how far methanol can be used safely in other ways; in the meantime, the Surgeon General recommends that methanol be used by the general public as an anti-freeze only, and that the precautions advised by the Bureau of Mines be strictly observed.—*Health News*, G-52-A, U. S. P. H. S.

Comparison of the Dominick-Lauter Test for *B. coli* in Water with that of "Standard Methods"

Final Report

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THOSE who have used standard lactose broth as a presumptive test medium for detecting *B. coli* in water know that a large number of positive tests are obtained from which members of the colon group cannot be isolated. Many workers have shown that these spurious presumptive tests, caused by either spore-forming organisms, symbiotic combinations, synergistic combinations, etc., introduce an error approaching 100 per cent during certain periods of the year. Errors of this sort greatly depreciate the value of standard lactose broth when used for the examination of waters, for it becomes necessary to make a confirmatory test that requires from 48 to 96 hours longer before a definite result can be reported. This procedure may take as long as 6 days for completion, which is too long for the test to be of immediate value to the water control analyst or to the sanitarian.

It would seem advisable, therefore, that there be found a shorter method of water analysis giving definite and accurate results within 24 to 48 hours. The procedure adopted should give as reliable results as the Standard Methods completely confirmed test, at the same time being as simple as the standard lactose broth presumptive test. It was pointed out in a preliminary report¹ that these conditions are satisfied by the new methylene blue bromocresol purple medium of Dominick and Lauter.² In this preliminary study, a comparison of the new medium with standard lactose broth was made on 300 samples of water from 91 different sources; the results showed that the per cent confirmation for the new medium was much higher than for standard lactose broth. This comparison has been continued until now 1,116 samples from 358 different sources have been examined. The results obtained bear out the conclusions of the preliminary report and conclusively show that this new medium is far superior to standard lactose broth for the detection of *B. coli* in water.

Procedure for the Comparison—The method of comparison for most water samples consisted in inoculating three 10 c.c., three 1 c.c., and three 0.1 c.c. quantities of suspected water into a corresponding number of tubes of the standard lactose broth and the Dominick-Lauter medium. In the case of waters known to be of good sanitary quality, five 10 c.c. and three 1 c.c. tubes were used. In the case of samples known to be highly polluted, greater dilutions were made in order to insure that the last dilution be negative. The tubes were then incubated from 24 to 48 hours, and as soon as 10 per cent or more of gas was formed in any of the tubes *all* gas positive tubes, regardless of dilution, were carried through the complete confirmatory test as outlined in Standard Methods.

Eosine-methylene-blue agar was used for the isolation of *B. coli*; two typical colonies from each plate being transferred to agar slants and lactose broth tubes. The formation of gas in the lactose broth tubes and the demonstration of Gram negative non-spore-forming bacilli in the agar cultures were considered as positive confirmatory tests. If such an organism failed to materialize the tests were considered negative for *B. coli*.

Preparation of Media—The standard lactose broth, eosin-methylene-blue agar and plain agar slants were prepared according to Standard Methods.²

The new medium was prepared as directed by Dominick and Lauter² with the exception of slight modifications recommended in a communication from J. F. Dominick. The corrected formula as used in this work is as follows:

Lactose	10	grams
" Bacto " peptone	10	grams
" Bacto " beef extract	5	grams
K ₂ HPO ₄ ·3H ₂ O	14.3	grams
KH ₂ PO ₄	2.0	grams

These substances were dissolved in 2 liters of distilled water at a moderate temperature (50–60° C.) and when dissolved there were added:

1.6 per cent alcoholic solution of bromocresol purple	4 c.c.
1.0 per cent aqueous solution of erythrosine	1 c.c.
1.0 per cent aqueous solution of methylene blue	20 c.c.

For the 10 c.c. inoculation of suspected water the above medium was tubed in 15 c.c. quantities, but for the smaller amounts 600 c.c. of distilled water were added to a 1 liter batch of this stock and this was tubed in 15 c.c. quantities. For pure culture work 666 c.c. of distilled water should be added to 1 liter of the stock media. The pH of the medium was determined electrometrically with a quinhydrone electrode and found to be pH 7.2.

TABLE I

TYPICAL REACTION OF *B. coli* IN THE DOMINICK-LAUTER MEDIUM

<i>Bact. coli</i> Strain no.		12 hours	18 hours	24 hours	48 hours
11	Color	Blue	Yellow-orange	Yellow-orange	Yellow-orange
	% gas	0%	1%	50%	50%
12	Color	Sl. yellow	Yellow	Yellow	Yellow-orange
	% gas	0%	2%	50%	50%
13	Color	Blue	Yellow	Yellow	Yellow-orange
	% gas	0%	0%	50%	50%
14	Color	Sl. yellow	Yellow-orange	Yellow-orange	Orange-red
	% gas	0%	2%	50%	50%

In order to become familiar with the reaction of the new medium, a few tubes were inoculated with known strains of *B. coli*.

In Table I are shown the results of these preliminary inoculations with four stock strains of this organism. The results of this experiment showed that there was a color change preceding gas formation which in some cases occurred as early as 12 hours after inoculation. This yellow to orange-red color and the large amount of gas formed is the typical reaction of the new medium to the growth of *B. coli*. This large amount of gas produced in the new medium might indicate the ability of *B. coli* to utilize the lactose in the new medium to a greater degree than in standard lactose broth.

The comparisons of Dominick and Lauter were apparently limited to four types of water all from the same source. Since it is quite well known that different sources of water vary as to their content of gas forming organisms or combination of organisms not belonging to the colon group, it seemed advisable to make the comparison on as many different sources as possible. The samples received by the Rochester Health Bureau Laboratories for examination suited this purpose admirably. Besides these a few additional samples were taken during a sewage pollution survey at the mouth of the Genesee River as it enters Lake Ontario, and a few others gathered from wells, springs, and creeks in the surrounding country. In this way the total of 1,116 samples from 358 different sources was obtained.

On comparison it was found that a much larger number of gas positive tubes was formed in standard lactose broth than in the new medium, but on confirming *all* tubes it was evident that a much higher per cent of confirmation was obtained for the new medium than for standard lactose broth. From the results in Table II it will be seen that of the 2,436 tubes of standard lactose broth showing gas, only 1,634 (67.1 per cent) were confirmed, while of the 1,475 tubes of

possibility of obtaining a negative result from a positive sample when only *one* tube is chosen for confirmation. In the case of the new Dominick-Lauter test, however, gas formation is in itself a completed test in over 98 per cent of the cases where only one tube shows gas, and where two or more tubes show gas, it was found to be complete in 100 per cent of cases.

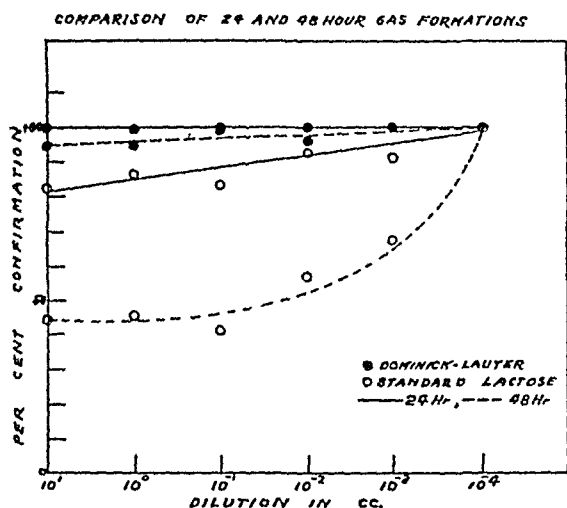


FIGURE I

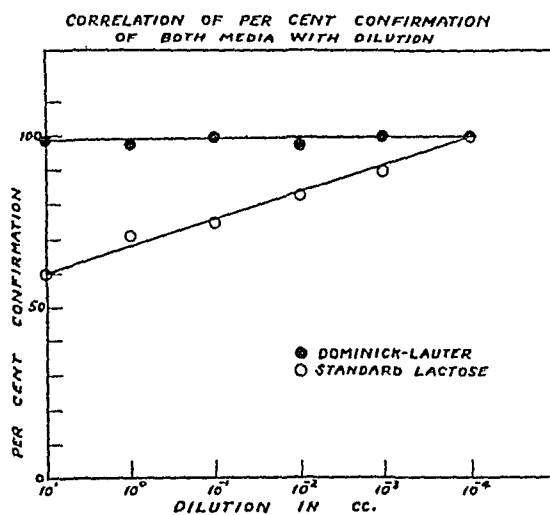


FIGURE II

The samples that showed agreement and disagreement are summarized in Table II. The final results obtained by both mediums showed agreement in 95.3 per cent of samples, whereas 4.7 per cent (53 samples) gave contradictory results. Examination of these 53 samples discloses the fact that 29 were Dominick-Lauter positive and Standard Methods negative while 24 were Standard Methods positive and Dominick-Lauter negative. It would seem to us that these variations could be explained by a combination of the law of probability with the very low colon index of the samples showing disagreement. Analysis of the data obtained from the records of these samples shows that in most cases only one or two 10 c.c. tubes showed gas, and in no case did more than one of the 1 c.c. tubes show gas; a fact which seems to support this view.

Another point of importance concerning the per cent confirmation is the comparison of the confirmation for the presumptive tubes showing gas at 24 and 48 hours. This correlation is shown in Table III and Figure I. The per cent confirmation for the standard lactose tubes showing gas at 24 hours was found to be much higher than the 48 hour gas positive standard lactose tubes, but the per cent confirmation for the 24 hour and 48 hour gas positive Dominick-Lauter tubes was approximately the same. In each case with the Dominick-Lauter medium the per cent confirmation was always between 95 and 100 per cent. This would indicate that as the length of time increases before

TABLE III

COMPARISON OF THE PRESUMPTIVE TUBES SHOWING 24 AND 48 HOUR GAS

	Standard Methods						Dominick-Lauter					
	10 c.c.	1 c.c.	0.1 c.c.	$\frac{1}{100}$ c.c.	$\frac{1}{1,000}$ c.c.	$\frac{1}{10,000}$ c.c.	10 c.c.	1 c.c.	0.1 c.c.	$\frac{1}{100}$ c.c.	$\frac{1}{1,000}$ c.c.	$\frac{1}{10,000}$ c.c.
Tubes pos. in 24 hours	470	480	296	57	16	7	472	283	127	25	13	6
Tubes pos. in 48 hours	680	290	130	7	3	0	286	169	79	12	3	0
Total tubes gas pos.	1,150	770	426	64	19	7	758	452	206	37	16	6
No. of 24 hour tubes confirmed	387	416	266	49	15	7	472	280	127	24	13	6
No. of 48 hour tubes confirmed	301	133	51	4	2	0	272	160	78	12	3	0
Total tubes confirmed	688	549	320	53	17	7	744	440	205	36	16	6
Per cent of 24 hour tubes confirmed	82.7	86.6	83.1	92.5	88.2	100	100	99.0	100	96.0	100	100
Per cent of 48 hour tubes confirmed	44.3	45.8	41.5	57.2	67.6	100	91.7	91.6	98.7	100	100	100
Per cent of all tubes confirmed	59.8	71.3	75.1	82.8	89.5	100	98.2	97.3	99.5	97.3	100	100
Per cent of all 24 hour tubes confirmed						89.9	99.6					
Per cent of all 48 hour tubes confirmed						39.9	95.8					

the production of gas in standard lactose broth, the per cent confirmation decreases. This fact supported by others' necessitates the confirmation of *all* tubes of standard lactose broth showing gas in 48 hours. The per cent confirmation for the new medium, however, remains so high in both instances that it would seem unnecessary to confirm either the 24 or 48 hour gas formations; a point which favors its adoption for both rapid and accurate detection of *B. coli* in water.

In calculating the per cent confirmations for the various dilutions it was immediately noticed that the per cent confirmation increased with the dilution in the case of standard lactose broth, but remained approximately the same in the Dominick-Lauter medium. This relationship, illustrated in Table II and Figure II, may be considered an index determining the relationship of the per cent confirmation to the amount of pollution existing in the suspected waters. The samples showing gas in the high dilutions (10^{-4}) may be considered as polluted water and those showing gas in the low dilutions (10^1) as question-

able waters. When this was correlated on coördinate paper, as shown in Figure II, it was found that the per cent confirmation for standard lactose broth was very low for the questionable waters, increasing as the pollution increased until it approximated 100 per cent. In the case of the new medium the per cent confirmation was always between 95 and 100 per cent regardless of dilution,

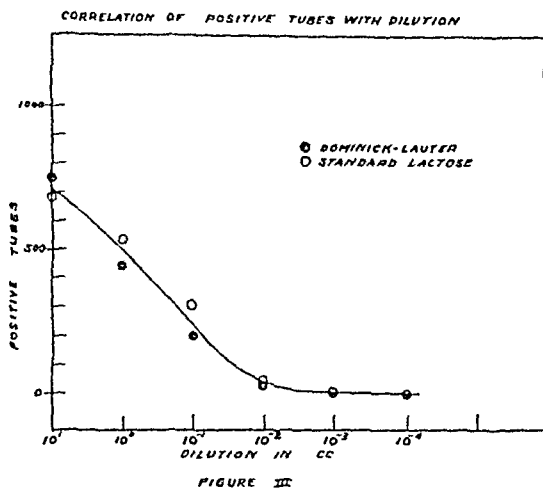


FIGURE III

showing the superiority of the new medium for detecting *B. coli* in waters of questionable sanitary quality. This fact seems to be true for both the 24 and 48 hour gas formations as illustrated in Figure I.

If the number of standard lactose tubes from which *B. coli* was isolated and the number of Dominick-Lauter tubes that showed gas be plotted as ordinates, the various dilutions being plotted as the abscissa, the graph obtained should show at once whether or not there are any large deviations in the colon index obtained by either method. It was found (Figure III) that the number of positive results obtained from the various dilutions was approximately of the same magnitude for either method; the maximum deviations being ± 57 or 3.6 per cent from the mean of the total number of tubes considered to be positive. This correlation again brings out how clearly the results of the Dominick-Lauter test compare with the results of the completely confirmed test of Standard Methods.

SUMMARY AND CONCLUSIONS

1. Eleven hundred and sixteen samples of water from 358 different sources have been tested according to the procedure of *Standard Methods of Water Analysis*² and compared with the new methylene blue bromocresol purple medium of Dominick and Lauter.³

2. The per cent confirmation for the total number of tubes showing gas and the total number of samples showing gas was much higher in both cases for the new medium than for standard lactose broth.

3. The per cent confirmation for the standard lactose tubes showing gas in 24 hours was higher than the per cent confirmation for the standard lactose broth tubes showing gas in 48 hours, but the per cent confirmation with the Dominick-Lauter tubes showing gas in 24 hours and 48 hours was approximately the same in each case.

4. The per cent confirmation for standard lactose broth increased as the amount of pollution in the water being tested increased, whereas the per cent confirmation for the new medium remained approximately the same.

5. Of the total *samples* showing a positive presumptive test 100 per cent were confirmed for the new medium whereas only 68.7 per cent were confirmed for standard lactose broth.

6. The new Dominick-Lauter medium was found to be far superior to standard lactose broth for the detection of *B. coli* in water.

REFERENCES

1. Leahy, Harold W. Comparison of the Dominick-Lauter Test with Standard Methods Tests for *B. coli* in Water. Preliminary Report, *J. Am. W. W. Assn.*, 22: 1493 (Nov. 1, 1929).
2. Dominick, John L., and Lauter, Carl J. Methylene Blue and Bismarck Purple for Differentiating Bacteria of the Colon-Aerogenes Group. *J. Am. W. W. Assn.*, 21: 1077-78 (Aug.), 1929.
3. American Public Health Association. *Standard Methods of Water Analysis*, 5th ed., 1925.
4. Levine, M. Notes on Experiences with the Presumptive and Confirmatory Tests for *B. coli* in Water Analysis for the American Expeditionary Forces, *J. Am. W. W. Assn.*, 7: 184 (Feb. 1, 1929).

Chronic Lead Poisoning in Infancy and Early Childhood

THE Metropolitan Life Insurance Company, as a result of a recent inquiry among prominent pediatricists, calls attention to the large number of cases of lead poisoning occurring among infants and children. The brief note points out that a Boston physician reports 50 cases of lead poisoning among children at a Boston hospital during the past 6 years. In these cases the diagnosis was proved beyond doubt, the source of lead being the paint on cribs, woodwork and toys.

It seems obvious that the simple precaution of using zinc paints in these cases should be resorted to. Lead poisoning due to the use of nipple shields and of lead ointments on the breasts of mothers was also considered a source of poisoning by the physicians interviewed.—*Stat. Bull.*, Metropolitan Life Insurance Company, 11, 10: 4 (Oct.), 1930. L. G.

The Research Laboratory and the Public Health Work*

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EVERY human endeavor, no matter how dry, all-absorbing or painstaking, carries with it a breath of sentiment as an inseparable complement of all that is great, good, true, and beautiful. Thus, in a gathering of men who meet primarily to discuss our present knowledge and the manner of solving serious and abstruse problems that require intense labor and thought concentration, there is this sentimental note, this delightful exponent of fraternal good will and professional solidarity, both uniting us in a common aspiration: to rise and go forward in our purpose to preserve the good health and to prolong the life-term of our fellowmen.

The progress obtained in the methods of safeguarding the public health, slow in its evolution during the early days, while human conscience and human reason remained apparently divorced one from the other, has attained gigantic proportions since the end of the 19th century. Free criticism and experimental methods applied to scientific investigation tend to light the way toward future and more exalted accomplishments. Hence, the work of the sanitarians cannot but receive the approval and praise of the population, and their meetings be a stimulus that draws the sympathies of all good-minded citizens, but a greater human sympathy must be stirred up by an assembly of this kind; to the scientific student, willing to devote his lifetime to the quest for truth that may add to the health and happiness of his fellows, it offers a reward that cannot be measured in money values, one that can only be found in the consciousness of the highest duty well done. I am proud to be with you tonight and, in appearance at least, to have taken a place within your ranks, for no other branch of our professional activities affords a greater measure of satisfaction to those who follow it; the priceless reward that comes to him who has unveiled one of

* Delivered at the Third General Session of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930:

nature's secrets and, by presenting it to his fellowmen, contributed thus to their happier or more contented lives.

In justice to this, I believe, every measure that this Association may have recommended is sure to receive favorable consideration on the part of the state and the federal governments and the health authorities connected with them, inasmuch as their duty is not only at present and materially to preserve the human body of the inhabitants, but also to prepare to defend it against conditions that finally tend to weaken it morally and intellectually, for—when studied from another point of view—hygiene, after all, constitutes an important chapter in moral philosophy. The physiologist Flourens has remarked that we do not die as a result of our habits, our passions, or our miseries, but that we kill ourselves with them. Recognizing this fact, public hygiene, or applied physiology, as it is called by Claude Bernard, has developed precisely into the guide to good habits, the guardian of our lives, which should prevent its shortening, its waste or its disruption.

It was not my intention to take up your time expatiating upon the wonderful and profitable worth of sanitary activities in our civilized communities, but more to call attention to, and demand a higher appreciation on our part of, the work of those men who labor unostentatiously, often almost unnoticed or unknown, in the research laboratories, hardly ever rewarded for the toil of months or years, sometimes the best of their lives, and without whose aid the ideas we have drawn of the greatest sanitary problems would still be in their infancy.

As the years pile on to constitute old age, one is prone to devote much time to reminiscences, and from such one is apt to fall into comparisons, notwithstanding the fact that, to the losing side at least, comparisons are always odious.

But life at its best, if it is to be enjoyed at all or well directed, must be made up of a series of comparisons, or computations of relative values, and it is only by establishing a proportional analogy between things that we come to appreciate clearly what is now better than before, or what has not improved, or what has even grown worse, in the years that serve as a criterion.

"Lest we forget," it is well to look back now and then and contemplate, from our heights of well-being and success, the extensive vistas of the recent past, lying at our feet, here and there seared, or wilted, or killed by the passage of time, while other patches within our view remain verdant, quite fresh and fruitful in their sterling worth.

The sciences that are involved in the practice of public health administration have certainly not been at a standstill; the subject of its colossal development as a whole, within the first quarter of this cen-

ture, is a source of the greatest admiration on the part of all public spirited citizens and the merest reference to some of its outstanding achievements cannot but fill our hearts with satisfaction; they broaden our horizons in the sphere of optimism for the greater preservation of life and health and induce us to hope for the total and final eradication of certain diseases that so forcibly strike mankind, that weaken it or despoil it sometimes in childhood, at others, in adult life.

The control of disease, in a general way, may be said to have been obtained only with regard to the infectious, or contagious maladies; all the others, not to mention the exceptions that prove the rule, have practically remained unaffected by any measures at our command; and in some cases, indeed, certain diseases seem to be on the increase. A general wave of what we might call "life extension practices"—which include the periodic medical examination with the resultant advice tending to correct deficiencies in diet or erroneous methods of life—that has spread into the homes through publicity campaigns of life insurance companies, backed by the support of the family physician, has led to a marked diminution in the incidence of those diseased conditions arising from disturbances of metabolism, degenerative processes, faulty renal, circulatory or glandular function, etc. These, although they do not play a very significant rôle in the demographic records, are frequently secondary or predisposing causes in the case of the infectious diseases. On the other hand, the great interest that has arisen in the direction of mental hygiene, as shown by the recent world congress held in Washington, must inevitably cause great advancement in the prevention of psychiatric conditions, a subject never heretofore considered with the attention and care that it certainly deserves. The movement is only 22 years old; its progressive development until the constitution of an International Committee promises well for the future of this long neglected branch of public hygiene that more than other better known allied sciences strikes directly at the prevention of extreme poverty, of immorality, vice, and crime, all these leading in one way or another to disease.

It is however with the infectious diseases, the most flagrant and widely disseminated, that we have been able to cope most successfully, and in all such cases—when we come to study their early history and the gradual evolution of our knowledge regarding them—we must admit that the research laboratory, by the discovery of facts relating to their origin and manner of propagation, established the basic principles that have served for our effective health campaigns. In some instances, the laboratory workers only brought forth the etiologic factors connected with the disease, but more often they went further and,

through wise experimentation with animals and by the discovery of biologic reactions, arrived at facts which made for early diagnosis, for specific vaccination, for immunization—the three mainstays of all extensive sanitary activities. The research laboratory has been the keystone that held together all the other contributing elements that have gone into the building of the magnificent temple erected to public health. But the laboratory has rendered valuable aid in other fields of the public health administration. Inasmuch as a state of health is not only freedom from disease, but also the attainment of normal development of brawn and brain, in the research laboratory are also carried out the investigations of food stuffs as to their health giving and vitality producing contents, not to mention their purity from a chemical or bacteriologic standpoint.

Just as symptomatology of disease and the science of therapeutics can only develop through clinical observation by the bedside, just so the control and suppression of disease can only be reached through, and is always based upon, some previous laboratory investigation.

The *fulcrum* that has served to move in a progressive direction the practice of public health administration may be represented by the intelligence of the people in combination with the campaigns of popular education in such matters, but the *lever* that has steadily promoted its advancement and raised it, I am glad to say, particularly in this country, to the level of the highest standard and the most far-reaching and beneficent pursuit, has been the work of research laboratories.

Every year, the A. P. H. A. through its special committees is bound to renew or modify methods or criterions mainly in relation to laboratory activities, without which a thorough application of modern processes in public hygiene would be difficult if not absolutely impossible.

I know we cannot boast of our success with cancer, or insanity, or with some of the endocrine diseases, but think what has been accomplished in the last 25 years and be satisfied and proud, if you like, respecting intestinal infection, tuberculosis, diphtheria, cholera, typhus, typhoid and yellow fever, and notice that all these have had the laboratories constantly at work in the solving of their etiologic problems.

Not wishing to make this modest address too wearisome or long-drawn, allow me to mention only one or two examples in which this decided help of the research laboratories has led to the remarkable success of the sanitary campaigns, based upon their findings. I will not, even cursorily, examine the problems of tuberculosis, plague, or cholera, where a decided impression has been made by the application of intelligent sanitary measures based upon their etiology and epidemiology, but let me draw your attention to diphtheria. I believe

that this is one of those diseases that will ultimately be left out of our mortality statistics.

Many of you must remember when the means at our command were practically unavailing in the treatment of this malady, how entirely beyond all efforts was the manner of its prevention. Barely 35 year ago—the scene is still vivid in my memory today—one of the most eminent pediatricians of all time, who had been called in consultation, Dr. Abraham Jacobi, and I stood in impotent dismay before the bed of a 5-year old child whose life had been prolonged the day before by means of an O'Dwyer laryngeal tube, and watched it ebb away now as a result of diphtheritic toxemia. The parents could have well paid half a million dollars to save their boy's life, and would willingly have done so, had it been possible. This was only a year before von Behring discovered antitoxin and only 2 before Park had it ready in New York. We see no such thing today; it would be deemed criminal negligence to allow such an instance to occur. Yet, if antitoxin, that excellent weapon in the hands of the clinician, has been the means of saving life, and, within certain limitations, preventing the disease from widely spreading, it loses much of its importance when compared with the later possible achievements in the field of prophylaxis. When Dr. Schick developed the test that allows the exclusion of immune children from any fear of infection, he only laid the foundation stone upon which you shall build one of the grandest monuments to preventive medicine, inasmuch as by immunizing the susceptible child, the fertile soil will be totally suppressed and, as the earlier physicians would express it, the disease for lack of *pabulum* will naturally die out.

The marvelous results of the procedure are self evident in numerous states. I am not going to fall into the trap of quoting statistics at this time, for I am sure of an unanimous opinion from this audience, that the toxin-antitoxin or the anatoxin immunization has been one of the most outstanding triumphs of man over disease.

Up to the last days of the 19th century we were absolutely in the dark as to how the malarial plasmodium got into the human system, although for 20 years we had been looking at it in the blood of our patients through the microscope. Just as so many other great truths have evolved out of the laboratory this came as a result of laborious research undertaken by Ross, and primarily by analogy with the malaria of birds. Subsequently the experiments of Low, Grassi, and their assistants in the Roman Campagna, and the transportation of infected mosquitoes to London where young Manson voluntarily contracted the disease through their bites, placed in the hands of sani-

tarians what seemed to be, at the time, the logical means for its control if not its eradication. The problem, however, has proved to be a many-sided one and, in truth, though many well directed campaigns have been carried out all over the world, sanitarians cannot on the whole be as satisfied with the results as with those obtained in other fields of their prophylactic efforts. Notwithstanding this, the knowledge of the mosquito transmission in this disease has enabled the people to reach marked improvement in health conditions in territories where life, until then, had been almost impossible; it has allowed the reclaiming of vast areas to the purposes of agriculture, or mining, and thus to the wealth of the countries involved.

The mosquito as a close neighbor is a nuisance, of course, but the consensus of opinion is gradually turning, in its search for a desideratum, more toward the malarial patient than the mosquito and, without losing sight of the latter, to treat the former, prevent the formation and, if already formed, eliminate the gametes from his blood and thus render the insects inoffensive, though bothersome.

You are all perfectly acquainted with such work, and the records show how a continuation of Gorgas's methods in Panama, with slight modifications, has kept the Canal Zone quite safe and habitable. In the Cuban and Central American plantations of the United Fruit Company, a business enterprise with a wonderfully well organized and equipped medical department, the latter has been enabled to promote greater sanitary improvements in those countries than their political governments could have done; the reduction in the morbidity and mortality of malaria has been nothing short of miraculous. You are no doubt acquainted also with the work of the National Malaria Committee in this country, its wide scope and its remarkable accomplishments in the line of malarial control and prevention, particularly in the southern states. In spite of all this, I fear that, for a long time, we shall see no such spectacular phenomenon in the way of its repression as we have had the privilege to witness in other of the infectious diseases. Of course, you are not so much concerned about it as we are in the tropics, but the North is the guiding star and we look to you, gentlemen, to carry the standard in this connection as triumphantly as you have done heretofore.

The one disease, to mention only one more, that has been as theatrical in its development as it has in its almost complete disappearance, as though at the waving of a magic wand, thanks to capable public health administration, has been yellow fever.

The idea of its connection with mosquitoes, suggested by some (Rush, Nott, McDowell) and directly pointed out by others (Beau-

perthuy, Finlay), was finally made a reality by the researches of the U. S. Army Board in 1901.

The discoveries of this Board, clearly demonstrating the manner in which man to man infection (Finlay's theory) took place, put into the hands of Gorgas and his followers the principles upon which to establish their campaigns.

It was no easy matter, that investigation that demanded human beings as subjects for the experiments, although within a period of 6 months it was completed and, besides the constant, almost incessant work, there were stirring moments of depression, of disappointment, that the investigators suffered, requiring a large amount of optimistic enthusiasm in the face of discouraging circumstances. Two of them developed yellow fever, one of them, Jesse W. Lazear, losing his life thereby. The sacrifice thus offered seemed to have appeased the furies of the dreaded scourge and, as you know, with the knowledge obtained, Gorgas instituted measures that extirpated the fever from Cuba and later made possible the building of the Panama Canal. Very soon after, other localities fell into line—Laredo, New Orleans, Vera Cruz, Rio Janeiro, Guayaquil. Today it can be found nowhere but in semi-civilized communities, the indigenous element constituting an almost insurmountable barrier to its complete eradication.

Like plague, typhus, psittacosis, diphtheria, and cerebrospinal meningitis, yellow fever has taken heavy toll of human life from among those engaged in its investigation: the names of Lazear, Cross, Stokes, Young and Noguchi have thus become consecrated and immortal.

Such epic histories cannot be often written into the annals of medicine, but they serve to point directly at what may be expected from the concerted action of specially trained men, instigated by noble motives, the work being carried out with perseverance and courage.

My object in selecting this fragmentary subject has been, not to shed wisdom upon matters best known to most of you, much less to entertain you with tiresome, because too oft repeated, references to noble work and achievement, but more to promote interest in some historical points of our vocation; not as a simple narrative, or a haphazard story, but as reminiscent of the evolution of great constructive ideas which took life in minds of the pioneer stamp of man.

All of you, I know, *have done things*; many of you have the good fortune to be still engaged in that all-absorbing work that deals with the preservation of your community's health; you are experiencing gratification such as comes only to the chosen ones. I salute you all and join hands with the few who, like myself, are eagerly watching, standing by, with a heart full of thanks.

Control of Measles by Honorary Quarantine

L. W. BRIDGMAN

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THE history of many outbreaks of disease shows them to simulate a fire, trivial at its origin but becoming more menacing and dangerous as new fuel is offered. By limiting the material upon which to feed, a fire may quickly be curbed; it is by similar disciplinary action that the highly communicable disease of childhood, measles, may peremptorily be controlled. Deny it more human fuel and measles will die a natural death.

This analogy was given convincing proof in the experience of the Village of Shorewood, Wis., an attractive suburb of 13,000 people adjacent to the City of Milwaukee, during the winter of 1929. In this municipality, where home-owning is a religion and community spirit has many commendable manifestations, the local Health Department proved that with full public coöperation an epidemic of measles can be brought speedily into subjection. Needed for the test in Shorewood was a community "healthmindedness," which was never lacking, and which found expression in popular coöperation with officials that remained at 100 per cent.

When measles spotted Shorewood's morbidity records early in January, 1929, and gained weekly accessions, Walter G. Darling, M.D., Health Commissioner, proposed to his Health Board an arbitrary procedure not founded in precedent, and received its support. Upon the community public health nurse, Irene H. Hansen, R.N., fell the responsibility for tracing the hundreds of contacts and imparting special instructions.

Shorewood's policy did not depend alone upon school inspection, since this fell short of controlling sufficiently the children exposed. The principle was followed of isolating and placarding the homes of all "contacts" (exposed persons not having had measles), and treating them as though they were actual cases. This was considered in the light of an "honorary quarantine."

School inspection is of much value in detecting cases and eliminating many contacts. But it was Shorewood's experience that some children showing no symptoms at the morning inspection, say 9 A.M.,

would by afternoon show beginning symptoms of measles, thus proving that the symptoms may develop between inspections on the same day. It was manifest that measles is infectious before any marked signs of the disease appear. This was believed to be sufficient reason for isolating all exposed children without waiting for symptoms to develop. Taking advantage of a closely knit community organization, the Health Department elected to enlist the existing public health morale among the citizens in the trial of this plan.

The "honorary quarantine" implied exclusion from school and other public places, even from the streets and playgrounds, not only of children who showed symptoms, but also well children who showed no visible evidences of measles, and against whom there was only the proof that they had associated with actual cases. Those exhibiting symptoms were subject to the usual placarding, and in the case of the contacts, without symptoms, the Health Department asked that an isolation of 10 days be rigidly enforced, to begin 7 days after known exposure. This was done, of course, to allow for variations in incubation, and time proved its wisdom beyond dispute.

A suspect card, about 3" by 5", authorized by the Health Board, was posted on every home harboring exposed children:

MEASLES CONTACT WITHIN

All persons are notified of a Measles Contact in this home, and on account of its communicable character before the actual onset of measles are warned against visiting or coming in contact with this case.

Measles contacts are prohibited from leaving the premises or coming in contact in any way with the general public.

All persons are forbidden to remove, obscure or mutilate this card or to interfere in any way with these restrictions, under penalty of a fine or imprisonment as provided in section 143.11 of the statutes.

By Order of the Board of Health, Village of Shorewood.

At this time the surrounding communities were experiencing measles epidemics, necessitating extreme care as to companionship not only in Shorewood but in other communities. In special bulletins Dr. Darling strongly urged that children who had not had measles be kept from all gatherings of whatever nature during the subsequent 2 weeks, and that visiting children who had never had measles be tactfully excluded from the placarded homes. It was emphasized that efforts would be of no avail unless parents exercised unusual vigilance with regard to the contacts which these children were allowed to make *outside of school*. This also applied, of course, to preschool children. The local baby clinic was discontinued for 2 weeks.

The epidemic's beginnings were of an explosive character. Twelve cases of measles were reported on January 7. All were traced di-

rectly to a church party held on December 24. Obviously, it was concluded, all had been exposed by a certain child at the church gathering. Through diligent tracing of contacts by the nurse, this case was discovered, the only one unreported during the epidemic.

On January 21, the list was augmented by 65 new cases, 20 of which were from already quarantined homes, leaving 45 new exposures, who were contacts of only 7 children out of the original 12 cases. The remaining 5 had no contacts and terminated with the family. By this time it was plain that an epidemic loomed, and efforts were made to exclude all exposed well children from schools and public places.

By January 24, the nurse's inquiries had revealed 200 known contacts who had never had measles. The entire group was excluded from school for 2 weeks. This was later reduced to 10 days, to begin 1 week after exposure, as a safer and more practical rule. As new exposures developed their contacts were excluded and a suspect card posted on their homes.

By January 31, 44 more cases had been listed, and on February 4, the number was increased by 71, all springing from the original 200 contacts who had been excluded from school and now had suspect cards on their doors.

By this time the fuel for the outbreak had been cut off and further infection prevented. From February 4 through the month the new cases fell off with regularity, the week of February 11 showing 21 new cases, February 18 the same number, and February 25 8 cases. In exactly 1 month from the exclusion of contacts (January 24 to February 25), the epidemic had completely subsided. The peak was reached on February 4 with 115 cases. In all, 250 cases were recorded. No complications or deaths occurred and, in accordance with the advice published by Dr. Darling, practically every case had the attention of the family physician. The epidemic's early termination, without fatalities, can be ascribed to the systematic following up of the contacts.

A child broke out with measles 3 days after attending a birthday party. Her association with playmates there resulted in 6 others developing measles. Their discovery was prompt and their exclusion saved the possible exposure of four school rooms and the infection of a different community. Again was the value of diligent tracing of contacts proved.

In Shorewood there are four school buildings, a high school, a parochial school, and two grade schools. Measles was a disturbing factor in three of these. It is interesting to note that the fourth, a parochial school with 439 pupils, situated across the street from the

Atwater school where there were many cases among the 798 enrolled, was untouched by the epidemic, escaping without a single exposure. This school had been prepared to handle such a situation and had given complete coöperation with the Health Department. The pupils followed all instructions to the letter. School was called and dismissed 15 minutes earlier than usual to avoid street contact, and unusual care was taken to prevent contact with any children not attending their school during the course of the epidemic.

The high school escaped with only 2 cases. This was not unusual in view of the greater age of the children, of whom a large percentage were probably immune.

Shorewood contains 3,554 families. Including preschool children, a minimum of 2,760 who had not had measles are estimated to have been protected from it by these control methods.

FORMS OF FAMILY COÖPERATION

In this emergency, the right arm of the Health Board was the public health nurse. The task of Mrs. Hansen was to establish communication with every affected home and impress the necessity of strict compliance with the program. The usual way is by personal visits, but since practically every Shorewood home has a telephone the nurse was able to give the special instructions and orders to every family without leaving her office. There were no exceptions to the proffers of coöperation, and all requests were complied with to the letter. This allowed the nurse additional time for centering on the investigational and follow-up tasks involved in controlling the epidemic. Had her time been given to home calls, it is obvious that a greater number of children would have escaped official observation and control, allowing a larger number of contacts to develop and complicate the situation.

Because the "health conscience" of Shorewood is highly cultivated, any apparent failure to report cases of communicable disease is likely to be revealed to the Health Department by neighbors, upon the righteous assumption that official rules should apply to all families alike in furtherance of universal protection.

OBSERVATIONS OF THE HEALTH COMMISSIONER

The methods which Shorewood found so effective in this epidemic are not to be branded as far-fetched or as suited only to our own local conditions. With school inspection, protection depends upon the school nurse in discovering the symptoms in the child, then in excluding the case. In facing this epidemic it seemed obvious that if measles was not to run its course in the village the further association of exposed persons, who have not had measles, with other susceptibles should be prevented. This could be done only by isolating all contacts before they could con-

taminate others or began to show any signs of measles at all. It is clear that this required treating those contacts as though they were actual measles cases. No state law is directed against the free movement of measles contacts, but our "honorary quarantine" proved as effective as an officially promulgated rule with a penalty clause.

The isolation of seemingly well children in such numbers led to the fear of possible interference with classroom work for these excluded children. This was avoided. Although the exclusion period for measles cases is 2 weeks, it was deemed feasible and safe in connection with the contacts to limit their exclusion to 10 days, this period to begin 7 days after the last exposure. Allowing, therefore, for Saturday and Sunday—non-school days—only 8 days of classroom work was to be lost. But these children, not being ill, were permitted to continue their studies through home work supplied by the schools. From the educational standpoint, therefore, no school work actually was lost by these excluded pupils.

The success of this effort for the control of measles was fundamentally due to the thorough education of the public which the epidemic hastened. The telephone call to affected homes was an important factor in enlightening parents upon the special duties enjoined upon them by the health authorities. Use also was made of special issues of the Health Department's monthly bulletin, which were sent to every home. In these communications it was admitted that such a drastic method of control would be of no avail, and in fact carried an element of danger of spreading the disease, unless parents realized the responsibility imposed upon them and kept children from contact with all others for 10 days. In our bulletin of January 24 we ventured to predict that with such coöperation the epidemic would be terminated in 30 days. This was the fortunate outcome.

It is my conviction that with a proper educational foundation among all families, any community can establish control over its susceptibles and cut off a budding epidemic. From the standpoint of epidemiology there is nothing technical nor impractical about it, but it does necessitate a more or less complete understanding by heads of families of the purposes in view, and unanimous backing of the health department in carrying them out.

The Health Problem in Mexico*

RAFAEL SILVA, M. D.

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THE American Public Health Association, since its birth, fifty-eight years ago, has made many valuable contributions to the cause of public health. In the year 1891 a Mexican delegation representing the Federal District and several states of the Republic attended the meeting at Kansas City, and it was decided that the next convention (1892) should take place in Mexico. From that date, a group of Mexican hygienists have formed part of the Association. Twice, in 1892 and 1906, the City of Mexico has had the privilege of being chosen as the meeting place for your conventions, and Mexico City on those occasions threw its doors open enthusiastically to receive the members.

Since the time of that last joint meeting, your nation was involved in the greatest of wars; and our nation has passed through a long period of suffering. Our friendship has stood many proofs and now, with the utmost pleasure, we come to this magnificent and prosperous city of the State of Texas to seal our everlasting friendship.

International understanding and international coöperation are indispensable to all. Today, with the means of speedy transportation in use, isolation is not possible, commerce and industry unite us with solidarity, while intellectual longing for truth and spiritual needs of beauty lead us to search in other countries wider and wider horizons. Superior minds turn toward a brotherhood unlimited by political and racial boundaries and to an effort for knowledge and understanding devoid of prejudice.

It is for these reasons that I have cheerfully accepted this invitation to expound our achievements and our aims in public health. This is not by any means an easy task. Allow me to recall the words of Dr. Franklin C. Robinson on the occasion of the 1906 convention in Mexico City: "It is a sign of the times," he said, "that associations and societies are impatient at long presidential addresses. They seem now as out of place in gatherings like this as the old long sermons and prayers would seem in a modern church service. And this is not

* Read at the First General Session of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

trol of venereal diseases. In my mind the recognition of prostitution creates a wholly unsatisfactory state of things, admitting an unjust difference between the sexes.

Our department conducts a Division of Hygienic Education and Propaganda. People from all social classes are gathered to receive education by films and lectures, while mothers' clubs and other associations are constantly asking for health education material, which we deliver daily. Posters, folders, radio talks and written articles for the newspapers are distributed and we have had the satisfaction of co-operating with the border states of the American Union in sending articles for the Spanish newspapers and in furnishing our written propaganda for distribution among the Mexican laborers who live in this country. This division of education has been active in coöperating with the National Committee against alcoholism.

Our work on child hygiene is not easy to recount in a few words. Perhaps we have not attained all of our aims because child hygiene is still divided between two different authorities: the Department of Health for the first and second infancy, and the Secretary of Education for school hygiene. Antenatal and postnatal work is taken care of by our free clinics established throughout the Republic and by our visiting nurses whose work in the proletarian homes is of first importance. The National Association for Infant Welfare, a private organization, subsidized by public funds, assists us in an active way, and has opened free maternities and day nurseries which have proved to be valuable agencies in reducing our child mortality. In the recent Pan-American Congress of the Child held in Lima, Peru, this work was favorably commented upon and our country was chosen as the seat for the next Congress.

In the Division of Food Hygiene (which unfortunately only has jurisdiction over the federal district), important work has been done in improving our milk supply. Pasteurization has been enforced, the tuberculin test is used on the cattle, and veterinary inspection rigidly eliminates causes of contamination. Bacteriological and chemical control is applied and the sanitary conditions of stores handling this food are constantly being watched. Meat, eggs, fish and other edible foods are also inspected by suitable methods in markets and stores.

The Division of Drugs and Chemistry is in charge of supervising the purity of drugs and of the campaign against illegal traffic in narcotics; a Committee on Patent Medicines and Proprietary Preparations endeavors to eliminate nostrums and frauds.

Our Division of Vital Statistics has been endeavoring to secure information from a wider source than heretofore. Many areas in the

Republic are still without adequate medical service; we have not yet enforced the extension to the whole Republic of the Federal Sanitary Laws in respect to notification of transmissible diseases because we have not yet reached complete accord with local authorities on the enforcement of these laws. It is for these reasons that we have no morbidity statistics of the whole Republic. In those places where a Federal Delegation functions, we are securing data. These comprise nearly all the important cities, the ports and the border towns. Mortality statistics are collected from certificates of death. These are defective in places where there are no regular physicians practising, because of lack of proper diagnosis, introducing a source of error.

It must be borne in mind that the Federal Sanitary Laws are recent. In 1917 the Constitution of the Republic was reformed, creating the Federal Department of Health. The old Board of Health of the Federal District was converted into a Federal Department, but the struggles of that period delayed the approval of the Federal Sanitary Code which was approved and published in 1926. It is easy to imagine that it was not everywhere well received as it created a source of friction between local and federal authorities, but it was a necessary measure in view of the insufficient work done by the local authorities.

Our aim now is to follow up our work for a better coöperation between state, municipal and federal authorities, uniting our efforts and organizing a combined plan for the establishment of sanitary units. This organization, which will eventually solve many health problems, will comprise the federal delegation in the capital of the state, the municipal units and the elementary units which are to be established in every town, with a fundamental educational basis, on which rural hygiene and sanitation will be founded. The technical direction of the Federal Department is the key for organized scientific health work, but coöperation of local authorities is necessary in order to supply the towns with all the services. Good water and proper sewerage are needed in many communities, particularly in the tropical regions, but this will be slowly attained because of the scarcity of funds available in the municipalities.

Among the branches that need development in our country, Sanitary Engineering is the branch which most needs more expenditure of money.

When a country is sparsely populated, natural resources have not been developed, and a large part of the population lives on low living standards, the problems are difficult to solve.

Our government, now under the guidance of President Ortiz Rubio, understands the prominent place of public health as a basis for any

other activity, and education of the laboring masses, together with the development of roads, irrigation projects and many other far-reaching efforts for the development of our wonderful natural resources will lead us some time in the future to a better life of peace and happiness.

The betterment of our knowledge in hygienic science is the basis for a better service to our country, infinitely loved.

We come here in search of enlightenment, which in the end will serve our people's cause. United, we will meet the needs and desires of our countrymen working in harmony for the good of all.

Sight-Saving Review

ELIHU ROOT has been elected Honorary President of the National Society for the Prevention of Blindness, it was announced by Lewis H. Carris, Managing Director of the National Society for the Prevention of Blindness. The post was made vacant by the death of the late William Howard Taft, who had been Honorary President from the beginning of the society in 1915 until his death last March.

The publication, in the near future, of a quarterly magazine, *The Sight-Saving Review*, devoted to all aspects of prevention of blindness and conservation of vision, was also announced by Mr. Carris. "The new journal," he said, "is designed to meet the needs of state and local prevention of blindness workers, educators, illuminating engineers, school physicians and nurses, safety engineers, public health administrators, industrial physicians and nurses, sight-saving class teachers and supervisors, ophthalmologists, and anyone interested in the sociologic phases of saving sight."

The Sight-Saving Review will contain original articles, abstracts from current periodicals throughout the world, book reviews, and reports of the society's activities. Mr. Carris is Editor and Isobel Janowich is Managing Editor.

The Decrease of Tuberculosis in Mexico*

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A DECREASE in the tuberculosis morbidity and mortality is observed in nearly all parts of the civilized world. This fact has been repeated and needs no demonstration since figures are easily available from many parts.

Mexico City statistics, notwithstanding the abnormal conditions through which we have passed in the last 20 years, show a steep decrease comparing favorably with that experienced in many large cities.

From a mortality of 500 per 100,000 inhabitants in 1900 we have reached a figure of 130 per 100,000. Compared with the mortality from all causes we can see that deaths from tuberculosis were 9.09 per cent of the general mortality in 1900, and 5.2 per cent in 1929.

Is this decrease due to efforts particularly directed against tuberculosis? Dr. Bermudez, Director of our Public Health School, has directed our attention to this problem, raising the question of the real value of a special antituberculosis campaign.

Though we have followed with great interest the advancement of methods employed against tuberculosis, the conditions in our country have been such as to limit our activities in all fields where great expenditures of money would have been necessary.

It was not until the economical status of the Federal Government improved that plans could be carried into effect to provide the means for such a campaign. It was last year that sufficient dispensaries devoted exclusively to tuberculosis were opened to the public. Before this tuberculosis patients attended the clinics of general medicine of the Welfare Board, and those considered as a source of contagion were isolated in the General Hospital or at their homes. The sanatorium for curable cases of tuberculosis will soon be completed. We can therefore say that, apart from the measures adopted against all contagious diseases, no special measures were taken until very recently.

Many health authorities claim that the decrease in the tuberculosis figures is due directly to the special measures taken. Is this a fact? It has appeared to us that the City of Mexico situation would throw

* Read before the Health Officers Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

light on the relative value of antituberculosis measures and this has decided the presentation of this paper. A review of the possible factors contributing to this decrease in this special case will be of some value in this respect.

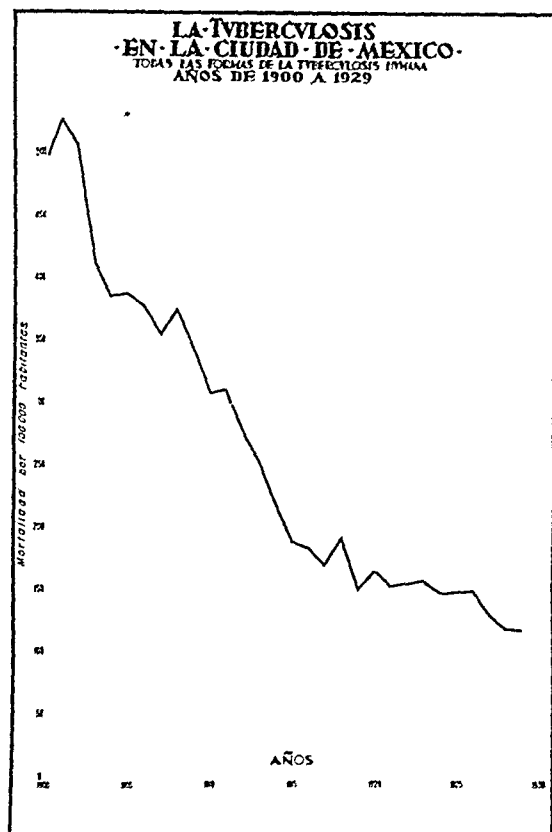
We cannot speak of a Mexican race. The error of adopting the term "Mexican" as indicative of a race has been repeatedly made in the United States where many statistics place the term "Mexican" alongside of "Negroes." "Chinese" and other terms properly used as indicative of a race.

Someone has said that the Mexican is not a Mexican. This paradoxical statement has been made in the sense that the Mexican may be white, Indian, mestizo or even Negro. Of course the word Mexican has a meaning: it means a nationality and not a race. Unfortunately in our mortality statistics we have not made a racial study, and in the statistics collected concerning Mexicans in the United States no race differentiation has been made. We do not even know the percentage of whites, mestizos and Indians emigrating from Mexico to the United States. Pure Indians as a rule do not emigrate, as they rarely segregate from their tribes. The white Mexican emigrates sometimes, but as he generally is in a better economical position in his own country, I imagine that the percentage is not in proportion to that found in our cities. This leaves as a probability the bulk of the Mexican population of the United States as composed chiefly of mestizos in a larger proportion than that found in our cities.

On the basis of statistics published in the United States, the statement has been made several times that the Mexican is highly susceptible to tuberculosis. We must try to see if this statement is true in a general way or even in a restricted sense; that is, saying that he is highly susceptible in the United States or in certain parts of the United States, we shall try to solve the cause of this susceptibility, if it is a racial or an economical, or an educational problem. On the facts we have at our disposition, we cannot find sufficient evidence to prove the general statement. Without the bonds of prejudice we cannot speak of a racial predisposition when, as I have said, no race statistics have been gathered. Even supposing that the great majority of the Mexicans living in the United States are mestizos, we do not know in what proportions the white and the Indian races are mixed. It may seem logical to accept as valid for the Indian what has been said of the American Indian or the Negro, but there is not sufficient ground for this generalization. Even in that case we do not know if the susceptibility is a true racial characteristic.

If we admit that there is a racial relative immunity of the white it

has to be explained. We cannot admit that the difference in race susceptibility is the result of natural selection, because probably all races are equally old on the earth, and they have been all alike subjected to the same natural selection. It has also been said that our education and civilization, with all our health work, works against the results of natural selection and not in favor of it. We, then, can think that civilization is preserving the feeble and not the strong, while modern and "civilized" war effects also a selection contrary to natural selection, as we are now sending to war and death the strongest men of our countries.



We could on the other hand think of an acquired immunity to tuberculosis which would be at the same time hereditary in character. It has been repeatedly said that acquired characters are not hereditary and, on the contrary, in relation to tuberculosis it would be easier to prove that there is an hereditary predisposition, as the sons of tuberculous parents are more predisposed to this disease. It has also been said that tuberculosis is recent among the colored races and this recent contamination has been pointed out as an explanation for the pretended susceptibility. If we are to accept this we would expect to find a greater susceptibility in the white race, enfeebled by a past record of heavy tuberculous infection.

Recent opinions expressed by such an authority as Calmette lead us to be more careful still in regard to acquired immunity to tuberculosis. Speaking about the interpretation of the Pirquet test, he points out that immunity to new infections exists as long as there are present in some part of the organism some causative agents living in a sort of symbiosis with the defensive cells. If this is to be admitted, we cannot expect to have an hereditary immunity to tuberculosis. The frequency of low grade infections in early life, as found by the Pirquet test, accounts for the acquired immunity in adults.

The Mexican Indian had, as a rule before the conquest, a higher grade of civilization than the Negroes in Africa. They did not live

only in scattered tribes, but formed communities some of which were cities of certain importance. We do not know certainly whether tuberculosis was present among them as we know of syphilis, or whether it was brought to Mexico with conquest. Anyway, there was a degree of human intercourse not comparable to that of other races, except the white. The Conquest was not only a war affair, but also a penetration that eventually led to a mixture of races; so the conditions are not comparable with the American Indian. Nearly 400 years have passed since the contact of the two civilizations and races; so we cannot say that contamination is very recent.

On the other hand, we cannot speak of inherently feeble and strong races. Though the Mexican mestizo of today may seem feeble in his physical organization to the passing observer, if we study the characteristics of these men we find certain qualities that may be surprising. The Indian is less subject to cancer, obesity, gout, chronic rheumatism, migraine, arteriosclerosis, chronic nephritis, and all those diseases that statistics show to be increasing in the white race. In regard to focal infections such as pyorrhea, tonsillitis, appendicitis and gall bladder infections, he is at a distinct advantage. His muscular development is not great, he is not of the unphysiological Sandow type, but has considerable endurance and, properly fed, he may compete in Marathon races using his customary sprint. We simply do not know the possibilities of this race when placed on a favorable economical and educational basis.

Returning to the issue in question, Mexico City statistics show the question of race susceptibility of the Mexican cannot be taken seriously into consideration. Race susceptibility is not a factor that can be modified in one generation.

Climate must be considered principally not in itself, but taking into consideration the personal and racial adaptation. The climate of Mexico City has all the advantages in relation to tuberculosis. Although within the tropical zone, it has an altitude of 7,350 feet. This explains its temperate climate, nearly even all the year round. The sun shines nearly every day and its rays are extraordinarily rich in ultra-violet radiations. This accounts for the rarity of rickets and tetany. The metabolism of calcium is thus favored with its beneficial effect on the process of healing of tuberculous focuses. The non-existence of tropical diseases such as malaria and hookworm, and the rarity of amebic dysentery in comparison with the lowlands, are factors in the sense that all these diseases contribute to predispose the individual to tuberculosis. High altitude is not a cause of organic trouble because it is easily compensated by increase in the red blood

cells. Pure Indians inhabiting the Sierras of Mexico and Puebla have more than six million red blood cells per c.m.

Speaking about predisposing ailments, in Mexico City gastro-intestinal troubles may be important factors, as we still have a high mortality and morbidity from these. Better hygienic education of the people can do much to correct these, as nearly all these diseases are due to errors in diet.

This brings me to the main point in prevention of tuberculosis. To my mind the most important thing to be done against tuberculosis is to bring better standards of living to the community. This means not only charity. In Mexico charity has an extensive field. From the time of the Spanish domination the missionaries burned in the purest of human love. But charity, being a treatment for these conditions, does nothing or very little in the way of prevention. Many times we are reminded of that rich man who did many charities, but before that, had made the poor. Charity is the only excuse we can offer to those that have been made poor. There are many ways of ruining men, not only taking away from them what they already have, but depriving them of the opportunities for an education and even creating in their minds an inferiority complex, or, speaking in plainer terms, robbing them of hope and confidence. Hope and confidence in their earthly life—not only in a future unearthly life—is what the Mexican Indian needs.

Hospitals, medicines, and kind words are, of course, the least we can offer to those who do our dirty work, the dirty work that we whites do not want for ourselves. The kind of charity that does not make racial or national distinctions, that is not a blow to human dignity, and that we call Christian charity can do much to alleviate these conditions, provided it is intelligently directed in the way of prevention—and prevention in the widest sense, because we live in 1930 and not in 1530. The widest sense of prevention is not prevention within the limits of a city, a state, or a nation, but prevention applied in an unlimited way to humanity regardless of all limitations.

We live in the days of Rockefeller, who has founded a medical school in China, not in the days of the Peking walls. The health of Chicago may be important to sanitarians of that city; but the health of Texas is also important for them, as is also the health of Mexico, and this meeting is a proof for this statement.

The tuberculous predisposition of the Mexican is the tuberculous predisposition of the low wage earner, and the low wage earner of today has not been relieved by machines and labor saving devices, but has been made more miserable by them, because of unemployment.

Machines are a blessing to the greater part of humanity who have been taught to use them, but for those who have to compete with their own muscles and only with their muscles, life is hard today. The low wage earner is not only the common laborer or peon, but also the woman who hardly gets a living with hand-sewing, or the artist unable to sell his pictures. Mexico is making an effort to change labor conditions, not in the sense of Bolshevism, but in the sense of applying better labor devices, ending primitive conditions of agricultural practices, building roads and irrigation dams, in the measure of its possibilities. * 1

The education brought to the Indian in rural and village schools, and the sort of hygienic education that we are striving to spread, has given us some fruits, but we are not satisfied and will never be satisfied, as our longing is unlimited. We are trying to restore in the souls of the Indian and mestizo the self-confidence and self-reliance which were long ago lost on account of domination in war and peace, by the use of material and moral means of subjection, suppressing their dreams in a perilous way that sometimes produces explosions outside the channels of order and law. These are factors in the fight against tuberculosis.

Other improvements, in housing conditions, in municipal sanitation, in the production and handling of foods, principally of milk, always recognized as very important, have brought undoubtedly good results, as well as the old measures of isolation and disinfection which still have their place in the modern fight against this terrible disease.

I do not doubt that the Mexican mestizo or Indian when he comes to this country may seem predisposed to tuberculosis. He comes from a country of even climate to one of extreme changes, where the language and habits are different, and where he feels himself under the pressure of an enormous economical power with the tremendous wear and tear of a life that means struggle carried to its most terrific strain, where even noise is unbearable to those not adapted to it. He is not prepared to meet such conditions, and he may often crumble under them. Modern complication of things is becoming hard for all of us. But this is not a racial problem, it is an economical and educational one, something which is changeable in one or two generations.

Now, we have adopted a special plan to fight tuberculosis on modern lines, because we know of its real value, but we are also convinced that this plan is only complementary to that explained above.

May this paper meet with your open minds, contributing to a better understanding and sympathy for the solution of one of our greatest problems.

Flooding as a Method for Controlling Extensive Areas of Fly Breeding

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THE employment of the principle of drowning in the extermination of fly larvae is not a novelty in sanitary science. Levy and Tuck¹ were the first to suggest the application of the principle. Their ingenious device for trapping fly maggots utilized the migratory habits of the maggots. They employed a manure-containing receptacle, which consisted of iron grating, or stout wire screening, of about $\frac{1}{2}$ inch mesh. Below the floor of this receptacle they placed a container with several inches of water, with or without poison. The maggots, in their wanderings; would drop into the water, and be drowned.

However, so far as our knowledge is concerned, our report relates to the first purposive attempt by man to control extensive areas of fly breeding by the extermination of larvae by drowning.

In order to make our experimental work more readily intelligible, it seems advisable to detail briefly the situation with which we were confronted. During the first two weeks of February, 1929, an enormous development of a species of alga, termed "lia" in Tagalog, occurred in the waters of Laguna de Bay, a lake about 10 km. southeast of the City of Manila. Great quantities of this aquatic plant had been deposited by the receding water over a large area extending along the western basin of Laguna de Bay, and certain portions of the bank of the Pasig River, and its tributaries. The area covered by this thick film of "lia" comprised a stretch of level land about 25 km. long and nearly 50 m. wide, extending along the edge of the water of the lake.

Upon dying, the aquatic plant ("lia") emits an obnoxious, fecal odor. The result of this was that swarms of adult house flies were attracted. In the decomposed algal material, and in the soft bed of earth and mud coated with a layer of decomposed lia, the females laid their eggs. An ideal breeding place for flies resulted; and the innumerable eggs which had been deposited hatched and developed into young maggots. As adult larvae, they issued from the decomposed

lia, and, seeking the nearest point at which they could enter the soil, burrowed down into the mud to pupate.

As a result of the above situation, a fly nuisance developed during April and May, 1929, which was unprecedented in the history of the Philippines. In the regions bordering the Laguna de Bay flies were present in such pestilential numbers that the inhabitants were compelled to eat their meals under mosquito bars, and United States Army horses in the affected area were compelled to wear masks for protection against the swarms of voracious flies.

The extensive fly-breeding area along Laguna de Bay affected the City of Manila to no small extent. The insect population of the city rapidly became augmented by numerous flies that came from the breeding places in the Laguna de Bay shores, notwithstanding the 10 km. which intervene between the two points. Traffic by land and water was chiefly responsible for facilitating the immigration of numerous flies into the city. We observed that boats, carts, and trucks of fruits and other merchandise, afforded shelter to adult flies, and brought along with them large consignments of the pests. The insects cling to the sides of bull carts, carromatas, automobiles, auto-buses, and even on the backs of animals and men that passed through or near the affected region, and thus were transported to the City of Manila and contiguous areas.

As soon as the fly situation had become a distinct nuisance, the people living in the towns near the Laguna de Bay suspected, and claimed, that the many tons of decomposed algae, which had been spread uniformly in a film of considerable thickness over the shore of the lake by its receding water, were the breeding ground of the flies. By the early part of May, 1929, the authorities had come to accept the truth of this. In view of the extreme seriousness of the situation in Manila and its environs, and because of the ineffective eradication measures that were being applied in the city against the countless adult flies, the School of Hygiene and Public Health was led to conduct an intensive study of the most practical and effective method for controlling, or at least arresting, the development of the pests in the early and most vulnerable stages of their life cycle in the breeding areas.

EXPERIMENTAL FINDINGS

From May 11, 1929, laboratory and field experiments were conducted for the purpose of finding an effective and practical method of exterminating the incredible multitudes of fly eggs, larvae and pupae in the breeding places along the shores of Laguna de Bay. The following were tried:

Spraying with Chemical Solutions—Several areas of fly-breeding, each 3 m. square, were outlined (Figures I and II). One square was sprayed with a 5 per cent solution of cresol, a second with a solution of clenral (sodium hypochlorite solution), and a third with petroleum.



FIGURE I—Spraying with chemicals a limited fly-breeding area

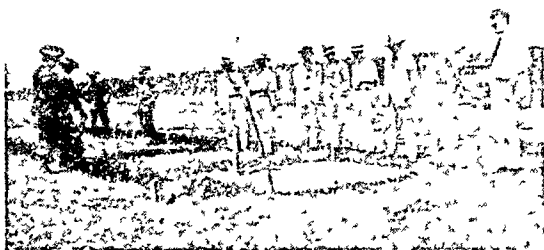


FIGURE II—Limited area of fly breeding preparatory to burning

Spraying with chemicals was found to be impractical, due to the high cost of materials, as well as of labor. To be effective, the soil must be thoroughly covered, or soaked, with the chemical solution, and the cost of spraying the whole breeding area would have been prohibitive. Unfortunately, they did not resort to the use of borates, as borax or calcined colemanite.

Burning—A portion of the breeding area 3 m. square was covered with rice husks (ipa), sprayed with kerosene, and set on fire. Another area was covered with dried shrub, and ignited. The burning method proved unsatisfactory and impractical, mainly because no suitable inexpensive material that would burn uniformly, thoroughly and sufficiently long was available. Moreover, the changing direction of the wind and the humidity were disturbing factors.

Stamping—Another spot was selected and allowed to be stamped by animals and man. This method likewise proved unsatisfactory; besides being slow, the stamping process could not be applied uniformly and effectively. Because of the softness of the area, it was found impractical to employ a road roller, or other convenient means of applying heavy pressure.

Surface Scraping—An attempt was made, in a limited area, to scrape the infested surface and then to bury the material, or dump it into the water. This method, too, was found to be impractical on the large scale required, because of its slowness, costliness, and the enormous amount of manual labor required.

Flooding—The above methods having been found to be impractical, it was decided to endeavor to drown the developing flies by flood-

ing the infested area with water from the lake. This method was found to be effective, economical, rapid and practical.

A low earth and mud dike, constructed from the materials on the spot, and enclosing a fly-breeding area of about 850 sq. m., was constructed in the fashion illustrated in Figures III and IV. It took 3 men only about 1 hour to build a dike 85 m. long and considerably thicker than was actually necessary to hold the water in place. Then, by the use of an old fire-engine rotary pump of 500 gal. capacity per minute, kindly loaned and manned through the courtesy of Engineer Santiago Artiaga, Acting Mayor of Manila, and Chief Vanderford of the Manila Fire Department, the enclosed area was flooded with water from the lake by way of an artificial canal dug for the purpose (Figure III).

It took less than 1 hour to flood the 850 square meters of experimental area. Upon inspection 7 hours after flooding, longer than necessary to drown the fly larvae and pupae, the area was still well submerged. Laboratory observations of pupae collected from the submerged area showed that all of them were killed. In fact, all of the pupae which were held imbedded in the soil of the flooded area—and these comprised the majority—were drowned, although it is probable that certain of them which floated to the surface lived to become adult flies. Experimentally, we determined that no normal pupae, obtained from the unflooded area, were able to survive complete immersion in water for 3 hours under laboratory conditions.



FIGURE III—Area of fly breeding flooded, showing dikes, canal and pit for bringing in water inland

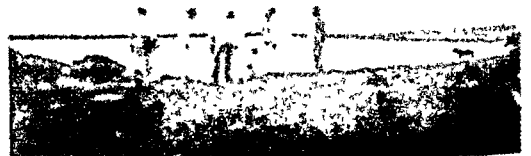


FIGURE IV—The diked fly-breeding area under water

For the flooding of the entire fly-breeding area, labor could have been minimized, and much time saved, by mounting several centrifugal pumps on floating rafts which would have been movable in any direction in the water. The employment of rafts would have eliminated labor expense in canal digging, to which we had to resort in our experiment in order to operate our heavy pump on firm land.

DISCUSSION

In the Philippines, unlike the countries of the temperate zone, there are only two seasons, the dry and the wet. The census of 1903² has this to say about thermic conditions in the Islands:

There are three different thermic conditions met with in the Islands. At some points the temperature is rather high throughout the year, the annual variation being but small; at others the temperature is always sufficiently temperate, varying only little during the year. Other places finally combine the characteristics of the two preceding classes, being hot during one part of the year and temperate during the other; they have thus two seasons.

As temperature is admitted to constitute one of the most important regulatory factors in fly development and prevalence, we include Figure V, for the purpose of giving an idea of the annual temperature variation in Manila and its environs.

It is to be noted that the atmospheric conditions during the rainy season are not necessarily unfavorable to fly development. Hence, it follows that there are flies all the year round in the City of Manila and its environs, but they are more abundant during the dry or hot season than the rainy season. This is largely due to the fact that, during the rainy season, the greater part of the potential fly-breeding places in the environs of Manila becomes submerged. A large proportion of eggs deposited in these areas during periods of dryness are affected unfavorably, because even if the eggs hatch, the probabilities are that the larvae will be drowned when the breeding place is flooded.

This is the principle upon which our experiment on artificially flooding a fly-breeding area was based; we merely took a leaf from the notebook of nature. In fact, our investigations of the conditions under which the flies had been multiplying enormously during the summer months, as well as our studies upon the practical methods of control, were commenced too late. After we had proved to our satisfaction that artificial flooding of a limited area was feasible, and we

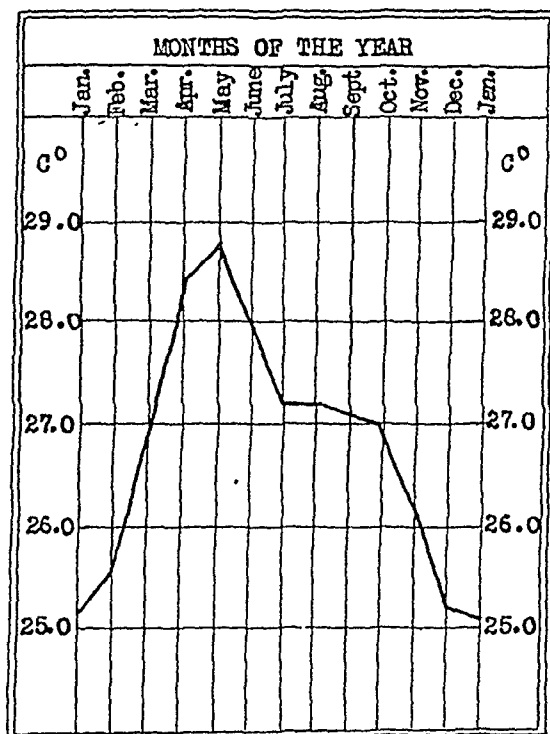


FIGURE V—Annual variation of the temperature at Manila (1880–1902)

had received an estimate from engineers that for \$7,500* the whole fly-breeding area along the shore of the Laguna de Bay (25,000 m. x 50 m.) could be effectively and quickly controlled by the flooding method, nature stepped in and completed the experiment for us. The advent of the rainy season, with very heavy rains, resulted in the wholesale drowning and extermination of the innumerable larvae and pupae in the extensive fly-breeding area, but not before the extreme fly prevalence had inflicted marked suffering and exacted its toll of priceless human lives, in municipalities around Laguna de Bay, from gastrointestinal diseases. While it is true that the reduction in the number of flies might not have been exclusively due to the rain flooding the fly-breeding areas, there can be no doubt that this was an extremely important factor.

In conclusion, we would suggest that a trial of the artificial flooding method, with certain necessary modifications, might be worthy of consideration in the control of fly breeding so commonly seen in extensive garbage and manure dumping grounds of such tropical cities as Manila. It might, perhaps, be tried wherever water is readily available, in lieu of the method of spraying small amounts of disinfectants in and around the city. This latter method is not only costly, and time-consuming, but, as now practised, it does not yield very satisfactory results. Repeated observations made by one of us (H. L.) have shown that, in spite of spraying the surface of garbage heaps with disinfectants, the decomposed materials are teeming with maggots about 3 in. below the treated surface. The spraying of disinfectants is ineffective, unless the breeding ground is thoroughly soaked with the disinfecting solution. Flooding the place with water alone, and drowning fly maggots, would seem cheaper and more practical than the spraying of small amounts of disinfectants, which are ineffective in most cases. Moreover, covering the refuse material with water alone once a week might hasten decomposition, which the addition of disinfectants tends to delay. Earlier decomposition results in earlier settling down and more rapid conversion of the material into soil.

In considering the possibility of fly control by the application of the flooding method in garbage and manure dumping grounds, it is essential that the breeding area be completely submerged with water for at least $2\frac{1}{2}$ to 3 hours, after adequate preliminary arrangements have been made for holding the water. The operation should be repeated at least once a week, until no more signs of fly development are noticeable.

* It is believed that the cost of control operations could have been further reduced if volunteer labor could have been procured from among the people of the affected region

SUMMARY AND CONCLUSIONS

1. This report is concerned with the experimental efforts at control of an unprecedented area of fly breeding along the shores of Laguna de Bay, a lake about 10 km. southeast of the City of Manila. During the first 2 weeks of February, 1929, an enormous development of a species of alga occurred in the waters of this lake. With the recession of the water, great quantities of this aquatic plant were deposited in a thick film over a large area extending along the western basin of Laguna de Bay, and certain portions of the bank of the Pasig River and its tributaries.

2. During April and May, 1929, this decomposing algal material furnished an ideal breeding place for flies, which resulted in a nuisance unprecedented in the recent history of the Philippines.

3. Beginning on May 11, 1929, laboratory and field experiments were conducted for the purpose of finding an effective and practical method of exterminating the incredible multitudes of fly eggs, larvae and pupae in the algae along the shores of Laguna de Bay.

4. In experimental areas, it was found that spraying with chemical solutions, burning, stamping, and surface scraping were impracticable and inefficient methods of fly control.

5. However, it was found that complete flooding with water of 850 sq. m. of breeding area resulted in the drowning of the great majority of the larvae and pupae.

6. The validity of our experimental demonstration of fly control by flooding was strikingly proved by the fact that shortly thereafter the rainy season commenced, and the flooding of the entire breeding area resulted in the complete control of the fly nuisance.

7. It is suggested that a trial of artificial flooding, with certain necessary modifications, might be worthy of consideration in the control of fly breeding so commonly seen in extensive garbage and manure dumping grounds of such tropical cities as Manila.

REFERENCES

1. Cory. *Bulletin 213*, Maryland State College of Agriculture, 1918, as cited by Herring and Greeley in *Collection and Disposal of Municipal Refuse*.
2. Census of the Philippine Islands, Vol. I, 1903, p. 96.

ACKNOWLEDGMENTS—Our sincere thanks are due Dean Edward R. Hyde of the College of Engineering of the University of the Philippines and Paul W. Mack, Chief Engineer of the Metropolitan Water District, for valued coöperation and aid.

We are very grateful to Dr. Wade W. Oliver for his kindness in going over the manuscript and offering many helpful criticisms and advice in the preparation of this paper.

Typhoid Fever Epidemic in a Leper Hospital

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IN June, 1929, a number of patients of the Taikam Leper Asylum, on Taikam Island, South China, developed an acute disease to which at first little attention was paid, but when one case after another developed, word was sent to the mainland to those in charge of the asylum. Fear spread among the Chinese directors and assistance was delayed. Just at that time we were making an inspection tour for the American Mission to Lepers. While in Canton, we heard that already one-fourth of the population had come down with the dreadful epidemic. The only attendant described the disease as an acute intestinal disturbance, lasting but a few days after it had progressed to tenesmus of the bowels. Nothing was said of the fact that the patients did not feel well for a long time previous to this final state. With the help of the Public Health Officer of Macao, and another noted physician of that city, we hastened to the island on a government customs launch for an investigation.

Before taking up in detail the epidemiological investigation it is necessary to discuss briefly the general plan of the institution.

The main buildings, constructed of stone with but little provision for ventilation, consist of 12 one-story dormitories, a church and administration building, a hospital, and kitchen, all built on a square 300 by 300 feet. Each dormitory, 50 by 33 feet, is built to accommodate 16 to 20 lepers. The buildings are close together and narrow streets lead from one to the other. They are located in a small cove on the island.

Taikam Island is about 3 miles long and its greatest width is $2\frac{1}{2}$ miles. It is mountainous throughout, and covered with underbrush. A ridge divides it in two parts. Streams, springing out of the ridge, supply each side separately. Each stream flows into a small bay, one to the south, called South Bay, and the other to the north, called North Bay. North Bay has two coves on which the leper hospital is found. South Bay has a large fertile valley which is occupied by sea pirates. Between the pirates and the lepers there is no communication, although the whole island technically belongs to the leper colony. The

absolute segregation of the lepers and the separate water supply for the two groups of inhabitants are of importance for our epidemiological study.

A beautiful stream of clear water supplies the leper colony. If properly guarded this would be sufficient for water and power. As it is, it is a source of great danger. Gardens above the colony are watered by the stream. Night soil from the colony is used for fertilization and the watershed is not protected.

Clothing too was washed in the stream above the place where the cook got his water for the kitchen. Latrines were built over the stream below the colony, and a shellfish bed in the bay thus became contaminated. Human feces were found strewn over the premises. According to Chinese custom, men and women were washing their clothes in the stream and others were beside them washing their teeth.

Upon investigation we found that about two months earlier a new group of lepers had been admitted to the colony and were put into the wards at once without the regular period of quarantine that should be observed in such institutions. After 2 weeks one of the new patients came down with the disease, and from that time on one after another was taken sick until no less than 52 of the 200 inmates had died of the disease. The only attendant present beside the lepers was a nurse who had had some training in leprosy but did not know the least thing about any other diseases.

We examined 4 of the patients still ill and soon came to the conclusion from clinical observations that the disease was typhoid fever. There was no laboratory; hence no microscopic examination could be made. We learned that the excreta of the patients had been thrown outside, and had undoubtedly found its way into the water supply, contaminating both the water used for cooking and the oyster beds. An interesting fact is that not one of the pirates came down with the disease, although their village is within a mile of the leper village, but, as explained, with an entirely different water supply and with no direct contact with the lepers in any way.

Epidemics of this sort rarely break out among leper patients owing to the isolation usually maintained. After the proper precautions were taken and the caretaker was properly instructed, the epidemic soon subsided, but at the expense of many lives.

Owing to the fact that there was no physician and not even a graduate nurse on the grounds, it is impossible to give exact figures. There were at least 60 cases of typhoid fever, of which only 3 are known to have recovered, though 5 are said to have done so. It is certain that 52 out of the 60 cases died.

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WHITE HOUSE CONFERENCE ON CHILD HEALTH AND PROTECTION

THE impression gained of the recent White House Conference* depended largely upon whether it was viewed telescopically or microscopically. In its broadest aspects it presented a galaxy of stars of varying magnitude, clustering about four main nucleuses—medical service, public health, education, and care of the handicapped. Within each group, the data with which it was primarily concerned had been thoroughly sifted. The wealth of material was condensed and brought into order and cohesion. Several comets and a few nebulae did not intercept the main orbit of the Conference. The only threatened interference occurred when the transfer of the child health work of the Federal Children's Bureau to the U. S. Public Health Service was recommended. The conference took no formal action on this controversial matter and it was referred to a Continuation Committee. The final complete reports of the Conference will undoubtedly be encyclopedic. They should furnish us with basic data for many years to come.

Viewed microscopically there appears to be very little, if any, new material contributed by this Conference. The existing data have been compiled and analyzed as never before, and guiding principles have been evolved. The scientific committees have been very cautious in erecting new standards and have requested more time to complete their

* See Child Hygiene Section

work. Basic needs certainly have been stressed, and the necessity for better administration clearly pointed out. The whole child in his many sided relationships now stands as a challenge to all those interested in his welfare.

At present the practical outcome of this Conference cannot be measured. It depends upon how largely local groups will be stimulated to apply scientific technics now at their disposal. Sound administrative procedures and ample funds are absolutely essential. Continuation groups and regional child health conferences are now in order.

SMALLPOX AND VACCINATION

THESE subjects are matters of perennial interest, especially to the citizens of the United States, which country has made such a bad showing in their control.

A recent report,¹ while presenting little that is new, discusses almost all factors concerning smallpox and vaccination. The facts have been collected from more than 20 countries and make up a survey of the practices and results obtained.

The first question considered is nomenclature, in the discussion of which many statistics are given as to the number of cases and deaths. With 3 exceptions, the death rate has been extremely low, and in only 1 case did the death rate reach the old-time figures. The conclusions drawn are that the generic name *variola* should be recognized as describing two varieties of the disease—*variola major* and *variola minor*, under the latter of which *alastrim* should be placed, with full recognition that it is not a distinct disease, but a mild type of smallpox; that the division is largely an epidemiological one; and that we are attempting to discover whether the two types are interchangeable.

Perhaps of more importance is the second question, which concerns postvaccinal encephalitis. A careful study of the condition in England and Holland, the two countries which have suffered most from this sequela, has been made. It must not be forgotten that we have been obliged to recognize encephalitis following vaccination in this country, some 20 cases having been reported, of which 3 have been confirmed by anatomical and pathological examinations. Unfortunately, the studies have not showed the prevention, but it is recognized that this condition follows the use of the viruses of many different strains in Europe and elsewhere.

The third part of the study is concerned with vaccination, under which we find the discussion of instruments, methods, cleansing of the

field of operation, dressings, concentration and control of viruses, purity and revaccination. It is perhaps needless to add that there are variations in regard to almost all of these. There is a general tendency to early vaccination, and glycerinated virus is used by preference. Most countries control contamination rigorously by bacteriological examinations for aërobic and anaërobic organisms. Dressings are not recommended officially. The choice is left to the physician in many cases. After our American experience with tetanus following the use of shields, one should be very careful in the employment of dressings. Simple gauze for protection is advised in some countries. There has been a surprising lack of experiments on the preferable methods of vaccination. Scarification is still used in many countries. In the United States it is believed that the best practice is that recommended by the U. S. Public Health Service—multiple pressure with the needle.

The figures on the results of revaccination are more interesting. In many countries it is not obligatory, although advised at periods varying from 5 to 7 years, and always in the presence of an epidemic.

We have long held and expressed the opinion that much damage has been done by the lack of insistence on revaccination. Too often has it been taught that a single vaccination protects throughout life. The data given in this report show most clearly the importance of revaccination, the percentages of successful retakes being from 45 to 95, very few countries reporting below 50.

It is impossible to give too much study to these matters and often rule-of-thumb methods taught during the medical course are followed. We cannot urge too strongly upon physicians and health officers the importance of vaccination and revaccination, employing the best methods and the best virus.

REFERENCE

1. Office International d'Hygiène Publique. *Rapport de la Commission de la Variole et de la Vaccination Antivariolique* (Session de Mai 1930). *Supplément au Bulletin mensuel*, t. XXII, No. 7, July, 1930.

RECORD FORMS FOR PUBLIC HEALTH WORK

IT has long been recognized by "big business" that administrative methods are notoriously behind manufacturing and production methods.

Public health is a "big business" and its proper administration a problem to which much consideration has profitably been given. Its management, control and promotion have not kept step always with scientific and technical progress. More careful thought and planning are needed. Public health administration requires the development

of a special technic, and certain aspects of standard business practice can be adopted as part of that technic with little modification.

The keeping of adequate and accurate records, at a minimum cost in time and money, is one of the major responsibilities of every executive, in or out of public health. "Big business" is using standard office forms, and filing methods adapted to particular problems. Public health can do the same as a simple improvement in administrative methods.

The Committee on Record Forms has studied record-keeping in health departments for five years with the avowed purpose of developing forms that can be included as part of the special technic necessary to maintain and guide a smoothly-functioning, efficiently and economically-managed health department.

The Committee presents, through coöperation with Remington Rand Business Service, Inc., which organization is publishing and distributing the forms approved thus far, twenty-five record forms for use in health departments. They are described on page XIX of this issue.

The Committee will release other forms for publication shortly. In its work, it "has aimed to devise record forms that would keep to the smallest number possible, hold to essentials only, and would group these so that the facts could easily be taken from them for statistical purposes." The committee has "constantly and primarily kept in mind the problems of the health officer of the smaller community and his need for economy."

Here then, in these twenty-five published forms, we find a real contribution to the business methods of a health department.*

* Health officers may benefit by consulting the Remington Rand Business Service, Inc., Buffalo, N. Y.

ASSOCIATION NEWS

GOVERNING COUNCIL MEETINGS AT FORT WORTH

THE Governing Council of the A. P. H. A. held four meetings at the Fifty-Ninth Annual Meeting in Fort Worth, all of them presided over by the President, Dr. A. J. Chesley.

One amendment to the Constitution and three amendments to the By-laws were adopted, as follows:

AMENDMENT TO CONSTITUTION

ARTICLE III, *Section A*, amended by the addition of the following at the end of the section.

6. A representative to be designated by each regional branch. Such representative shall be a Fellow of the American Public Health Association.

AMENDMENTS TO THE BY-LAWS

ARTICLE I, *Section A, Part 1*, 11th paragraph, amended to read as follows:

"The right to hold office or to serve as chairman of a committee in the Association shall be limited to the Fellows of the Association, whether Section Fellows or unaffiliated Fellows. The right to hold office or to serve as chairman of a committee in a Section shall, however, be limited to the respective Fellows in such section. This provision shall not prevent the election of a Vice-President of the Association who may not be a Fellow."

ARTICLE VI, amended as follows:

"There shall be at least one annual meeting of the Association, held at a place to be selected by the Governing Council. All papers and reports presented at the annual meeting and other meetings, including regional meetings, shall be the property of the Association for publication unless this right is waived by the Committee on Meetings and Publications. Special meetings of the Association may be called by a majority vote of the Governing Council, the Executive Board, or the Association."

The following amendment to be added at the end of Article I:

"If, in the opinion of the Executive Board, any member or Fellow of the Association be found (hereafter) to have permitted the use

of his name, or otherwise to have allowed himself to be quoted or used for illustration in the advertising of a commercial product, in such a manner as to reflect discredit upon the Association, his Fellowship or membership in the Association shall thereupon be terminated. The application of this article shall not be retroactive."

Eighty-two members of the Association were elected to Fellowship, and the following Life Members were approved:

Louis I. Dublin, Ph.D., New York, N. Y.
Edgar E. Hume, Boston, Mass.
Sally Lucas Jean, New York, N. Y.
Cornelia Lyne, New York, N. Y.
Stanley H. Osborn, M.D., Hartford, Conn.
Herman von W. Schulte, M.D., Omaha, Neb.
Marguerite A. Wales, R.N., New York, N. Y.

The Committee on Fellowship and Membership recommended Dr. Aristides Agramonte of Havana, Cuba, for election to Honorary Fellowship in recognition of his inestimable services in demonstrating the transmission of yellow fever and its control. This recommendation was adopted unanimously by the Governing Council.

The application of the Georgia Public Health Association for affiliation was also approved. This makes 15 state societies which are affiliated with the A. P. H. A.

In accordance with the constitutional provision that the Governing Council should receive from the Executive Board at the Annual Meeting of the Association a report on the work, accomplishments and financial status of the Association during the year preceding the Annual Meeting, and a formulated statement of a program of the major activities proposed for the ensuing year, the Chairman of the Executive Board presented his report, which will be pub-

lished in full in the *Year Book*. This indicated, among other things, that the financial condition of the Association is sound, the net asset value on August 31 being \$27,763.09, representing a gain of \$8,605.75 for the first 8 months of the year.

The following tables, which show the number of members in each of the 14 affiliated societies and the distribution

of members and Fellows in the sections, are also taken from Dr. Rankin's report.

At this time there was also approved the constitution and by-laws of the recently established Western Branch, which closely follows the A. P. H. A. constitution.

There was presented to the Governing Council a report of a conference held in Detroit, June 24, 1930, in which several

DISTRIBUTION OF MEMBERS AND FELLOWS IN THE SECTIONS—SEPTEMBER 1, 1930

Section	Total Member- ship in Each Section	No. of Fellows	Per cent of Total Fellows	No of Active Members	Per cent of Total Active Members
Health Officers	486	169	21.9	317	9.5
Laboratory	442	129	16.7	313	9.4
Vital Statistics	90	37	4.8	53	1.6
Public Health Engineering	370	110	14.2	260	7.8
Industrial Hygiene	149	43	5.6	106	3.2
Food, Drugs and Nutrition	138	38	4.9	100	3.0
Child Hygiene	265	70	9.1	195	5.9
Public Health Education	277	37	4.8	240	7.2
Public Health Nursing	275	29	3.8	246	7.4
Epidemiology	32	20	2.6	12	0.4
Unaffiliated	1,574	90	11.6	1,484	44.6
Total	4,098	772	100.0	3,326	100.0
Add	56 for Sustaining Members, Affiliated Societies and Honorary Fellows				
Total Membership	4,154				

NUMBER OF MEMBERS IN AFFILIATED SOCIETIES

Year of Affiliation		Affiliated Members	Members who are also members of A. P. H. A.	Total Members of Society
1928	Connecticut Public Health Association	40	49	89
1925	Massachusetts Assn. of Boards of Health	69	72	141
1922	Michigan Public Health Association	151	155	306
1928	Missouri Public Health Association	22	123	145
1923	New Jersey Public Health Association	110	84	194
1925	New Mexico Public Health Association	19	4	23
1927	Northern California Public Health Assn.	76	97	173
1927	Ohio Society of Sanitarians	111	227	338
1925	Pennsylvania Public Health Association	84	47	131
1927	Southern California Public Health Assn.	368	102	470
1928	South Carolina Public Health Assn.	13	40	53
1925	Texas Public Health Association	112	67	179
1925	Virginia Public Health Association	69	58	127
1926	West Virginia Public Health Association	91	48	139
Total		1,320	1,147	2,467

national organizations, including the A. P. H. A., had participated, relating to the development of an organization to be known as The American Committee for the Prevention of Deafness. This matter was referred to the Executive Board for consideration inasmuch as the idea was prevalent that there was already in existence an organization for the hard of hearing.

Montreal was chosen as the place for the 1931 Annual Meeting of the Association by written ballot on the report of the Sub-committee on Annual Meeting of the Committee on Meetings and Publications.

The Resolutions Committee presented 14 resolutions to the Governing Council, 8 of which were adopted, the others either being disapproved or referred to other bodies within the Association. The resolutions adopted dealt with the American Museum of Hygiene, the George Washington Bicentennial, the eradication of tuberculosis, Indian welfare, the safety of milk supplies, tick-borne diseases, political interference in public health work and deceased members. The resolutions in full will be printed in the *Year Book*.

The following officers were elected for the year 1930-1931:

President-elect—William C. Hafler, M.D.
First Vice-President—Rafael Silva, M.D.
Second Vice-President—J. W. S. McCullough, M.D.
Third Vice-President—Arthur H. Flicker, M.D.
Treasurer—Louis I. Dublin, Ph.D.

The report of the tellers was presented and the following Governing Councilors were elected for 3-year terms expiring in 1933:

C. E. A. Winslow, Dr.P.H.
Thomas Parran, Jr., M.D.
George H. Bigelow, M.D.
S. J. Crumbine, M.D.
John A. Amyot, M.D.
M. J. Roreau, M.D.
W. S. Leathers, M.D.
John Sundwall, M.D.
Livingston Farrand, M.D.
Emery R. Hayhurst, M.D.

This completed the business of the retiring Governing Council. Upon the adjournment of the last meeting, the new Governing Council convened, with the new President, Dr. Hugh S. Cumming, in the chair. There was also present at this meeting Dr. Rafael Silva, the First Vice-President.

At this meeting two members were elected to the Executive Board for 3-year terms, namely, Dr. Haven Emerson and Dr. John A. Ferrell.

CHILD HYGIENE SECTION

OUR readers will note with pleasure the revival of our Section on Child Hygiene, which has been inactive for the past year, owing to the fact that Dr. Merrill E. Champion, who conducted it so ably, was called to duties which demanded his entire attention. We owe a debt of gratitude to Dr. Champion.

The field was carefully studied before appointing a successor, and it is with great confidence and satisfaction that we are able to announce that Dr. Richard A. Bolt, Director, Cleveland Child Health Association, has consented to take charge of the work. Dr. Bolt

needs no introduction. He occupies a most enviable place in the special branch of medicine to which he has devoted his energies. His reputation is not confined to our country, but extends wherever children and their welfare are considered. Dr. Bolt has called to his assistance 12 specialists in child hygiene from different parts of the country. Under his guidance, we are assured that our *Journal* will carry the best and most carefully selected material on this subject.

The Editorial Staff, as well as the general membership of the Association, welcomes Dr. Bolt.

NEW MEMBERS

Health Officers Section

- Robert A. Allen, Toronto, Ont., Member, Board of Health
 W. G. Carnathan, M.D., Butler, Ala., Health Officer, Choctaw County Health Unit
 George H. Conklin, M.D., Superior, Wis., Health Commissioner
 R. Ronald Dettre, Norristown, Pa., Health Officer
 C. S. Glover, M.D., Russellville, Mo., Deputy State Health Commissioner
 Samuel H. Haigler, M.D., Austin, Tex., County Health Officer, Travis County
 Herschel L. Hendricks, M.D., Minneapolis, Kans., County Health Officer, Ottawa County
 C. E. Johnson, M.D., Seymour, Tex., County Health Officer
 Herman S. Judd, Tacoma, Wash., Director of Health
 Jos. H. Kinnaman, M.D., Cincinnati, O., Chief Medical Inspector
 Dr. A. C. Leslie, Snyder, Tex., County Health Officer
 D. Long, M.D., Duncan Okla., County and City Superintendent of Health
 Herbert A. McClure, M.D., Tallahassee, Fla., District Health Officer
 Agustin H. Mejia, Vera Cruz, Mex., Health Officer
 I. D. Russell, M.D., Burkburnett, Tex., City Health Officer
 Edward H. Schoenling, M.D., Cincinnati, O., Health Commissioner, Hamilton County
 William F. Singer, Pueblo, Colo., County Health Officer
 W. E. Spivey, M.D., Brownsville, Tex., Acting Assistant Surgeon, U. S. Public Health Service
 A. B. Tate, Russellville, Ark., Medical Director, Health Unit, Field Agent, U. S. Public Health Service
 Richard R. Thompson, Eureka Springs, Ark. (Assoc.)
 R. G. Vogel, Bradford, Pa., Health Officer
 William R. Webb, Tulsa, Okla., Supervisor, Dept. of Health
 John W. Williams, M.D., Monroe, La., Director, Ouachita Parish Health Dept.

Laboratory Section

- John Chornyak, M.D., Pittsburgh, Pa., Medical Officer charge Pathological Laboratory, U. S. Bureau of Mines
 Ralph Duncan, M.D., Kansas City, Mo., Director of Laboratories, City Health Dept.
 Thomas S. Gilchrist, Montreal, Que., Assistant to Technical Director, Eastern Dairies Ltd.

- Stanley E. Hartsell, Battle Creek, Mich., Instructor in Public Health, Battle Creek College
 George McL. Lawson, M.D., Louisville, Ky., Prof. of Bact., Univ. of Louisville
 Herbert Noll, Long Beach, Calif., Laboratory worker

Vital Statistics Section

- J. F. Blackerby, Louisville, Ky., Director, Bureau of Vital Statistics, State Bd. of Health
 Elva E. Gore, Springfield, Ill., Acting Assistant Registrar of Vital Statistics
 Alexander K. Powell, El Paso, Tex., Registrar and Statistician

Public Health Engineering Section

- Porfirio T. Arreola, C.E., Laredo, Tex., Director of Sewer Works
 Ernest B. Black, C.E., Kansas City, Mo., Consulting Engineer, Water Purification
 J. T. Cook, Dublin, Tex., City Water Works Supt.
 F. R. Hassler, B.S., Oklahoma City, Okla., Asst. Sanitary Engineer, State Health Dept.
 Roy J. Morton, B.S., Nashville, Tenn., Director, Div. of San. Engr., State Dept. of Health
 Benjamin Orvananes, Mexico City, Mex., Engineer, Public Health Dept.
 G. A. Phillips, Houston, Tex., Field Sanitary Engineer, Wallace & Tiernan Co.
 J. D. Rogers, Port Arthur, Tex., Supt. Water Purification
 Edward J. Ryan, Houston, Tex., Supt. Garbage Dept.

Industrial Hygiene Section

- Arthemey A. Horvath, Ph.D., Pittsburgh, Pa., Research Chemist, Bureau of Mines
 John McCombe, M.D., Montreal, Que., Chief Medical Officer, Canadian Nat'l R. R. Co.
 Frank V. Meriwether, M.D., Picher, Okla., Surgeon in charge U. S. Bureau of Mines Coöperative Clinic
 Bud A. Randolph, Houston, Tex., Inspector, Industrial Hygiene
 Joseph N. Redfern, Chicago, Ill., Manager, Medical Dept., Chicago, Burlington & Quincy R. R. Co.
 Helmuth H. Schrenk, Pittsburgh, Pa., Chemist in charge, Biochemical Laboratory, U. S. Bureau of Mines

Food, Drugs & Nutrition Section

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 Oliver K. Burrows, Chicago, Ill. (Assoc.)
 T. R. Dickson, Houston, Tex., Chief Food Inspector
 J. T. Hawkins, Tyler, Tex., City Sanitary Inspector
 Matthew E. Highlands, Dayton, O., Research worker, Relation of Food Preservation to Health, Frigidaire Corp.
 Clara Kimble, Houston, Tex. (Assoc.)
 Emmett Trant, San Angelo, Tex., Food Inspector
 Oscar B. Williams, Austin, Tex., Assoc. Prof. of Bact., Univ. of Tex.

Child Hygiene Section

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 Oscar A. Cannon, Hamilton, Ont., Director, Child Welfare, Dept. of Health
 Ernest R. Carlo, M.D., Fort Wayne, Ind., Pediatrician, Duemling Clinic
 Goldie B. Corneliuson, M.D., Ishpeming, Mich., Associated with Child Health Div., Childrens Fund
 Edward Durney, M.D., Buffalo, N. Y., Director of Child Hygiene, Dept. of Health
 Gladys Eyrich, Jackson, Miss., State Supervisor of Mouth Hygiene, State Bd. of Health
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 Harold R. Roehm, M.D., Birmingham, Mich., Health Officer, Bloomfield Hills
 Dr. Rafael Santamarina, Mexico City, Mex., Secretary of Education, Dept. of Hygiene
 Edward F. Timmins, M.D., South Boston, Mass., Supervising School Physician, City School Dept.

Public Health Education Section

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Susan D. Swarts, R.N., Los Lunas, New Mex.,
County Health Nurse
Mattze V. Wilburn, R.N., Fort Worth, Tex.
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Gabriel G. Cossa, M.D., Vera Cruz, Mex.,
Asst. Physician to Vice-Director, Rural
Health Work
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Unaffiliated

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Member, Health Section, League of Nations
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NEW YORK, N. Y.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

A Printing Division in a Health Department—The Milwaukee Health Department reports that it uses two multigraph machines which are operated almost continuously for the printing of forms and educational material used by the department. A skilled operator is employed for this purpose. Practically every blank form used by the health department, in addition to a considerable number of pamphlets and other educational leaflets, is prepared in the department's printing division. Electroplates are made for the routine forms which can be rapidly fitted to the multigraph machine and any desired number of forms printed in a very short time. There is not only a saving in expense, but the additional factor of rapid service at a time when it is most desired.

The department estimates that it saves in printing from \$5,000 to \$10,000 per annum over the cost of having the work done by a job printer. In addition to all blank forms, the department prints its own quarantine placards, all small dodgers and many letters. For such publications, a sulphite paper is used which costs from 7 to 8 cents per pound when purchased in ton lots. The department also prints its own letterheads, using a linen paper which costs about 50 cents per pound wholesale. In a single day there were distributed in Milwaukee 112,000 copies of a milkman's letter, and educational literature for the diphtheria prevention campaign has been published in the department's own printing division.

The Detroit Department of Health has had a division of printing for the past 12 years in which are printed virtually all the forms of the department.

most of its educational material, letters addressed to practicing physicians and other groups interested in the work of the department. The *Weekly Health Review* is also printed.

The Detroit Health Department uses three automatically-fed multigraphs and keeps one hand-fed machine for small work. Two experienced operators are kept busy. The department also has a Set-o-type machine which sets type by use of an ordinary typewriter and just as fast as any typist can write. This machine is used for special reports. The Detroit Epidemiologist has been holding a series of medical clinics at the contagious disease hospital which have been well attended by the medical profession. In fact, the average attendance at these clinics, which are held once a week, has been 230 for the current year. Every week each physician is given a complete report of the previous lecture, which averages from 25 to 35 pages. There are 400 copies prepared each week. This work is all handled on the Set-o-type machine which, as previously stated, writes the story as fast as the ordinary typewriter.

Electroplates are used for all of the fixed forms of the department and the forms are printed on the automatic multigraphs. There is also a mailing list of all physicians in the city which is adjusted to a fill-in multigraph which gives the appearance of a personal letter to each physician addressed. This is a very effective means of stimulating the interest of the practitioner of medicine, as he feels that he is receiving personal attention.

The department also uses a battery

of Hooven typewriters which are used for many purposes, prominent among which are the letters which are sent to all parents as the child attains the age of 6 months, reminding the parents that it is time to have the child protected against diphtheria. This letter has all the appearance of a personal one, the child's name being entered in the body of the communication in two different places, and yet the whole operation is automatic and electrically controlled.

The Detroit Health Department uses a water-marked grade of sulphite bond paper which costs approximately 11½ cents in white and 13½ cents in colors. This paper can be used for most all purposes including the departmental letterhead which is a big factor in the cost of stationery. The department uses approximately 2 tons of paper per month and the saving to the city is approximately 40 per cent of the cost of printing were it done elsewhere. The great advantage of a printing division in a local health department is the improvement in service which is completely within the control of the department. It is possible to prepare over night for an impending epidemic of influenza or measles, printing the record forms to be used by nurses and other employees, as well as the educational material and instructions directed to the parents and general public. (The editor would appreciate receiving a description of the printing divisions of other health departments.)

White House Conference on Child Health—The Committee on Public Health Organization submitted its report to the Conference on November 20, and among its recommendations pertaining to federal health organization were the consolidation of all major health activities under the administration of the U. S. Public Health Service, and the assignment by this Service of personnel to other federal departments.

It was recommended that Congress grant additional authority and appropriations to the Service to broaden its general public health program, especially in the field of child health, and to grant funds and personnel for the development of local health departments.

With regard to state health organization, the committee recommended larger appropriations in the various states and approved the policy of federal aid to stimulate local responsibility.

With respect to city health organization, the committee recommended that there should be provided for every local area (whether city, county or combined units) the service of a full-time local health organization with a well trained personnel and adequate financial support. The committee feels that the experience of the municipal health departments has demonstrated conclusively that programs for the improvement of the health for the mother and child can successfully be conducted only as part of the general program of a well organized health department.

Coördination and coöperation with the nonofficial agencies, with the health officer as the one person in the community directly responsible for the health of its people, was recommended. It was felt that each particular function in the field of health promotion should be performed by the agency best fitted to perform it.

Health administrators recognize the importance of medical service to the health program and therefore commend efforts on the part of organized medicine to improve the quality of medical service and increase its availability. It is further recognized that certain parts of the health program should be further developed by increasing the preventive work of private physicians and dentists.

Health organizations should appreciate the importance of engaging only competent and trained persons and of establishing conditions of employment

which will attract and retain persons of ability. Facilities for instruction should be suited to the needs of the modern public health program. Both the federal and the state health authorities should definitely accept the responsibility for rendering expert consultation service to local governments and for assisting them in expanding their health organization and in improving public health practice. Medical schools should be encouraged to make more adequate provision for teaching preventive medicine and medical practitioners should be encouraged to practice modern curative and preventive medicine in their respective communities.

Health Demonstration in Rutherford County—A report has been prepared covering the period of the Commonwealth Fund Child Health Demonstration in Rutherford County, Tenn., from January, 1924, through December, 1928. The personnel during the 5-year period included a director, a pediatrician, a director of nursing service, 5 white and 1 colored nurses, a director of school health education, and 2 sanitary inspectors. In 1920 there were 33,059 people living in Rutherford County of which Murfreesboro with 8,000 population is the county seat.

At the outstart, there were 3 accepted principles which guided the demonstration: (1) that the rural public health program must be generalized and balanced, (2) that local official status is essential, (3) that the community should be encouraged to provide the greater part of the financial support. The program was planned so that at the end of a 5-year period there would remain in the county a rural health department supported by a locally subscribed budget approximating \$30,000.

In January, 1924, at the very beginning of the demonstration, the director was made Health Officer of Rutherford

County and of Murfreesboro, thus tying the demonstration and the local health organization together. Prior to that time there had been a part-time county health officer who received \$700 a year and a part-time city health officer at \$300 per year. There was no hospital in the county.

The examination of school children was selected as one of the first steps of the program as it immediately brought the health organization into contact with a large number of parents and presented an admirable opportunity to spread health educational propaganda which was so essential to the main objective of the demonstration, that is, creating a local interest and responsibility for the maintenance of organized health service. By 1925 it was possible to set up a new school examination program with two principal objectives—health education and the correction of defects. The blue ribbon plan, which had been used successfully in other child health demonstrations, was employed to stimulate competition and interest on the part of the child and parent. The nursing service was gradually extended. Child health conferences were held, including infant and preschool services, and finally prenatal work was undertaken. At the same time there was an improvement in the sanitary index of the county and a milk control system was established.

By 1929 the county was appropriating \$.03 on each \$100 of assessed valuation which, by the end of the demonstration, had been increased to \$.10, giving a yield of \$22,500 per annum which, added to the appropriations of the city of Murfreesboro, the subscription of the local Red Cross chapter and the funds of the state health department, made a total of \$32,236 or about \$.98 per capita. This sum was available for the continuation of the program at the time the demonstration came to a close.

Prior to the demonstration, the *Appraisal Form* gave the county a score of 110 points out of the possible 1,000, while in 1928 the score had increased to 814 points. A modern 50-bed hospital was built and equipped by the Commonwealth Fund in 1927, and operated with local support.

The broad community health service visualized in 1924 was an actuality in 1928, there being employed from local funds a health officer, 2 sanitary officers, a director of nursing, and 5 staff nurses, 2 clerks, laboratory service, and the expenses incidental to quarantines, transportation, supplies, and equipment.

The State Health Commissioner, Dr. E. L. Bishop, states that success has, in large measure, been attained and provided by the influence of the demonstration on the public health program on the state as a whole and by its stimulus to similar methods of approach in the fields of both technical and administrative methods.—Harry S. Mustard, *Cross-Sections of Rural Health Progress*, The Commonwealth Fund, 1930.

Health Demonstration in Marion County—Comparison is afforded of accomplishment during the 5-year period

1925–1929, during which the Commonwealth Fund maintained a demonstration in Marion County, Ore., with the 5-year period 1920–1924 preceding the institution of such demonstration.

The infant mortality rate of Marion County has been reduced by 22 per cent in contrast to a 13 per cent reduction for the state of Oregon and a 10 per cent reduction for the United States Registration Area. The neonatal mortality has been reduced 24 per cent by the county compared with 13 per cent for the State of Oregon and 6 per cent for the United States Registration Area.

The reduction in the maternal death rate has been 51 per cent for the County, having dropped from 7.3 to 3.6 per 1,000 births. At the same time the mortality rate for the State of Oregon was reduced 17 per cent and there was a reduction of 6 per cent in the United States Registration Area.

Public health work in Marion County in 1924 scored only 202 points out of a possible 1,000 allotted by the *Appraisal Form*. By 1929 the score had increased to 819 points.—E. F. Warner and Geddes Smith, *Child of the Covered Wagon*, Commonwealth Fund, 1930.

LABORATORY

C. C. YOUNG, D. P. H.

AN APPARATUS FOR ROTATING SERUM-ANTIGEN MIXTURES IN THE KLINE TEST FOR SYPHILIS

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KLINE and Young^{1,2} have described and perfected a micromethod for the diagnosis of syphilis, in which 0.05 c.c. of the serum to be tested is placed in the center of a paraffined ring on a

microscopic slide, a drop of antigen³ added and the reagents thoroughly mixed by rotating the slide. The diagnosis is made with the aid of a microscope. While reliable and sensitive, the

Kline test has the disadvantage of requiring a 4-minute hand rotation of each specimen, necessitating the expenditure of an undue amount of time and labor when many specimens are tested. No apparatus designed to perform this operation has been described.

In an endeavor to relieve the laboratory worker of the necessity for hand rotation, an apparatus which successfully performs this operation has been designed, and is described below. The rotary shaker may be connected to a timing clock possessing electrical make and break connections so that the specimens are automatically rotated for exactly 4 minutes. During this interval, the next series of tests can be set up, or the series just removed from the machine can be read. As a result of the uniform speed and diameter of rotation of all specimens tested, a uniformity of results may be obtained which is difficult to duplicate by hand methods.

The apparatus (Figure I) consists of an electric motor (J), which operates a

standardized speed reducing mechanism (I), causing the slotted head (II), to rotate at a speed of exactly 120 r.p.m., thus producing a corresponding rotary motion of the rotary head (ABC) about the ball bearing guides (E, E'). The rotary head is so constructed as to hold rigidly the 2" x 3" slides commonly used in the test, 6 of which can be rotated at one time.

The base of the rotary head, shown in Figure I (C), is constructed of a well seasoned, stained and varnished oak board, measuring $1\frac{1}{4}$ " x $5\frac{3}{8}$ " x $7\frac{1}{16}$ ". A thoroughly dried board is essential. A rectangle of the above dimensions is first accurately marked out on a larger board, then (Figure II) centering lines are drawn through each of the four corners. Having thus determined the exact center of the board a circle of 3"-radius is scribed on its surface. All markings must be very accurately made. Using a machine drill, a hole $\frac{3}{16}$ " in diameter is bored through the center of the board. Similarly, holes 1" in di-

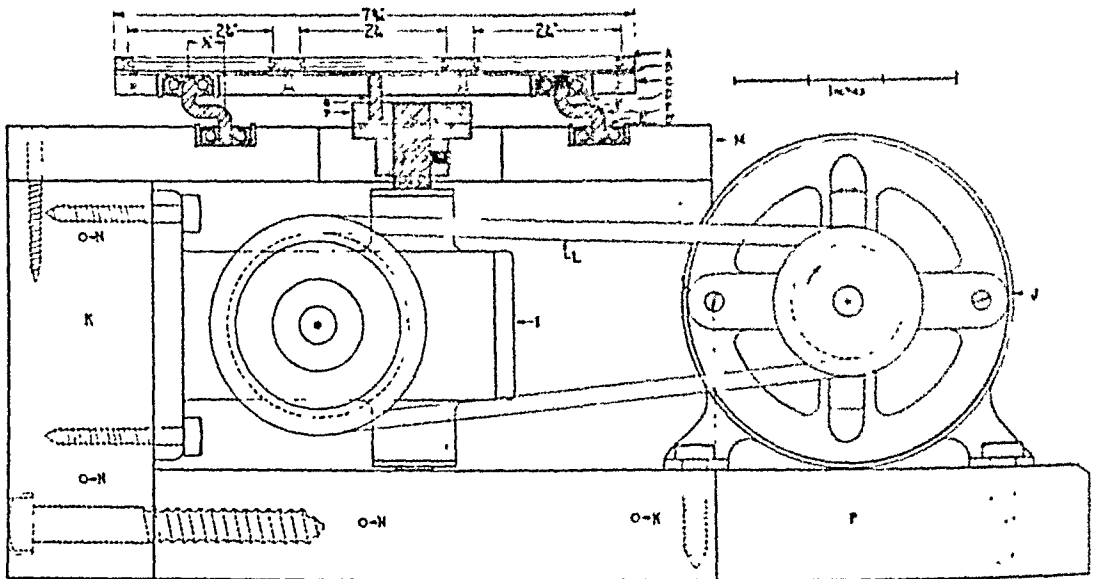


FIGURE I.—Side view of the rotary machine showing the details of its construction. A. Slide holder. R. Brass base. C. Oak base. DD'. Bearing guides. EE'. Combination radial and thrust ball bearings. F. Connecting rods.

G. Drive pinion. H. Driving head. I. Speed reducer. J. Electric motor. K. Oak support for speed reducer. L. Drive belt. M. Platform. N. Screw holes for side board. P. Oak base.

ameter are bored through the wood at each of the intersecting points of the circular and diagonal marks.

A sheet of hard rolled brass (B), $\frac{3}{32}$ ", of the same length and breadth as (C), is next placed in accurate juxtaposition to the latter, and fastened by means of flat headed machine screws (Figures I and II) and the ends filed off smooth with the surface of the brass sheet. The outlines of the holes through (C) are next scratched on the under surface of the brass sheet, which is then temporarily removed from the wooden base. Four brass bearing holders (D) each $\frac{1}{4}$ " in length, and accurately machined to an internal diameter just sufficient to hold the ball bearings rigidly (E), are next exactly centered over the marks and soldered to the under surface of the brass platform. These holders must be accurately turned and cut in the lathe so that when soldered in position, their axes are at exactly 90° to the plane of the brass sheet.

The brass sheet is refastened to the wooden base, and through it is bored a $\frac{3}{16}$ " hole opposite the center hole in (C), into which is inserted a steel pinion (G), $\frac{3}{16}$ " in diameter and $1\frac{1}{16}$ " in length. This pinion, which extends through the wooden base, is soldered into position, or if desired the end may be threaded and screwed into position.

Brass guides (A), the length of which corresponds to the width of the platform (Figures I and II), are next soldered to the platform. The two outer guides consist of $\frac{1}{4}$ " square brass rod, the inner sides of which are channeled to a depth and width of $\frac{1}{16}$ ". The two inner guides consist of $\frac{1}{4}$ " brass bar $\frac{1}{2}$ " wide, channeled on both sides similarly to the two outer guides. These are carefully soldered into position as shown in the illustrations. Many 2" x 3" slides are slightly wider than 2", but should the particular lot in use be ex-

actly 2" wide or less, the distance between the guides should be slightly decreased. The outer ends of the slide guides should be widened by filing (Figure II), to facilitate placing the slides in position.

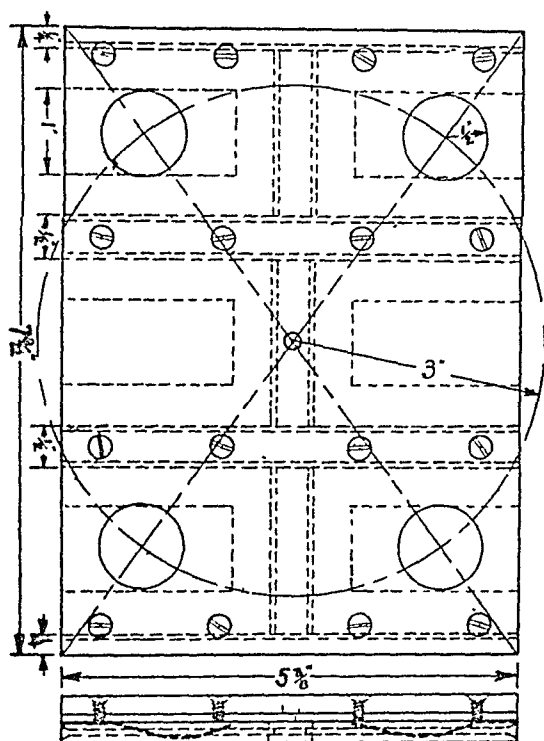


FIGURE II—Construction details of the rotary head and slide holders

The slides are inserted in the guides to a depth of $2\frac{1}{2}$ " only, leaving $\frac{1}{2}$ " of the glass protruding for use as a handle in removing the slide. The depth to which the slides are inserted is governed by means of sections of brass bar of the same dimensions and channeled similarly to the two main inner guides, each $1\frac{15}{16}$ " in length, which are soldered to the base (Figure II).

Rectangular pieces of spring brass, 0.01" thick, 1" wide and 2" long, soldered in the center of each slide guide and bent upward so that they press against the bottom of the glass, effectually prevent the slides from being thrown out when the rotary head is in motion.

Nice style R combination radial and thrust ball bearings are used for carry-

ing the load of the radial head. These bearings* have a $\frac{3}{16}$ " shaft opening and an outer diameter of $1\frac{1}{16}$ ". If desired, the four upper ball bearings may be soldered into position or fastened into the bearing guides by screws.

The rotary head is connected to the lower platform (M) by four connecting rods (Figure I(F)), each ground to fit firmly into the ball bearings, and accurately bent so that the ends are parallel. These rods measure exactly $\frac{1}{2}$ " from center to center.

The lower platform (M) is constructed of well seasoned $\frac{3}{4}$ " oak lumber 8" wide and approximately 10" long, in the center of which is an opening 2" wide and $2\frac{1}{2}$ " long, to accommodate the head of the driving mechanism (H). With a machine drill, holes sufficiently large to hold the ball bearing guides tightly (D') are accurately bored in the wood to a depth of $\frac{1}{4}$ " in positions exactly corresponding to those made in (C).

The brass bearing guides (D') are machined to hold the ball bearings (E'), somewhat less tightly than those in the rotary head, so that they may be easily inserted or removed, permitting removal of the entire rotary head. The bearings must not fit loosely, or trouble will result.

Holes through which are placed wood screws for fastening the platform to the side-boards of the apparatus should be bored in the end and sides of the platform (M) (Figure I).

The base (P) of the apparatus is constructed of $1\frac{1}{2}$ " oak approximately 13" long and $6\frac{1}{2}$ " wide for a distance of $7\frac{3}{4}$ ". For the remaining length, the base is $\frac{3}{4}$ " wider on each side, the thickness of the side-boards used to enclose the speed reducing mechanism. These side-boards, measuring $5\frac{1}{2}$ " in width and $7\frac{3}{4}$ " long are fastened to the

base and end by means of screws at the points (N). A 2" oak block (K), $6\frac{1}{2}$ " wide and $5\frac{1}{2}$ " high is glued to the narrow end of the base, and securely bolted in position with 2 4" lag bolts, as indicated. Before this block is fastened to the base, it is drilled to accommodate the lag bolts used to support the speed reducer (I). The location of these holes must be carefully determined by trial, so that when it is bolted in position, the center of the speed reducer is exactly centered between the 4 ball bearings (E'), and in the center of the 2 x $2\frac{1}{2}$ " opening cut through the platform (M).

The speed reducer (I) is filled with soft graphite cup grease, or transmission grease, and then bolted in position with 2" lag bolts. This piece of apparatus is the standardized speed reducer BU-10 made by the Boston Gear Works, and has a speed reducing ratio of 1 to 10. As supplied by the manufacturers, the lower end of the shaft is $1\frac{7}{8}$ " long, and should be cut off to reduce the space needed for the apparatus.

The upper shaft is cut to a length of $1\frac{3}{16}$ ", and a specially made cast iron or brass driving head $1\frac{5}{8}$ " in diameter and 1" thick (Figure I(H)) is fastened on by means of a pointed screw fitting into a depression in the shaft. The driving pinion (G) fits loosely into a slot $\frac{1}{4}$ " wide and $\frac{1}{4}$ " deep, cut entirely across the face of the driving head.

If comparable results with the Kline test are to be obtained by technicians in various parts of the country, conditions such as the time and speed of rotation, and the diameter of the swing of the specimens must be accurately controlled, since preliminary experiments would seem to indicate differences in results obtained by variations of these factors. An arbitrary rotation speed of the specimens of exactly 120 r.p.m. has been selected by the writer, the diameter of the swing being 1". To ob-

* Catalogue No. R-501, Boston Gear Works, Inc., Norfolk Downs, Mass.

tain this speed, it is necessary to determine accurately with the aid of a revolution counter the speed of the particular motor used rather than to trust in the accuracy of the indicated r.p.m. stamped on it. Knowing the speed of the motor, the speed reducer ratio and the diameter of the drive wheel of the speed reducing mechanism, the diameter of the drive pulley of the motor can be readily calculated. The electric motor, which should be not less than $\frac{1}{30}$ H.P., should be of the low speed type, of approximately 1,750 r.p.m. With this, and a speed reducer pulley diameter of 3", a motor pulley with a diameter of 2" should be used to obtain the proper speed of the rotary head.

The motor is fastened to the base by means of lag bolts, and may be connected to the speed reducing mechanism by means of a leather or piano wire spring belt (L). The latter type of belt, while slightly more noisy than leather, does not tend to slip so readily under the light tension which should be used.

The electric connections to the apparatus consist of a standard 110 v. toggle switch and electric cord attached to the motor base. Should it prove desirable automatically to control the 4-minute period of rotation, one of the wires lead-

ing to the wall plug should be cut, and the ends connected to two binding posts screwed into the base of the apparatus. By attaching an electric timing clock in series with these posts, the period of rotation of the rotary head may be easily regulated, relieving the technician of the bother and responsibility of accurately carrying out this step.

SUMMARY

An electrically driven device is described, which mechanically mixes by rotation the serum-antigen mixtures used in the Kline test for syphilis, and which will hold as many as six 2" x 3" slides at one time. The rotary speed of the apparatus has been arbitrarily set at 120 r.p.m., through an arc of $\frac{1}{2}$ " radius. The apparatus may be connected to an electric timing clock, thus relieving the technician of the necessity for timing the period of rotation, resulting in a greater uniformity of results and a saving in the time necessary to perform the tests.

REFERENCES

1. Kline, B. S., and Young, A. M. A Microscopic Slide Precipitation Test for Syphilis, *J. A. M. A.*, lxxvi: 928, 1926.
2. Kline, B. S., and Young, A. M. A Microscopic Slide Precipitation Test for Syphilis, *J. Lab. & Clin. Med.*, xii: 477, 1927, *Am. J. Syph.*, xi: 290, 1927.
3. Kline, B. S. An Antigen for Use in Serum Tests for Syphilis, *J. Lab. & Clin. Med.*, xiii: 588, 1928.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Vital Statistics for England, 1929—The Registrar General's annual *Statistical Review of England and Wales* gives a population estimate of 39,607,000 for England and Wales, an increase of 0.32 per cent since 1928.

There were 313,316 marriages solemnized during the year, representing a rate of 15.8 persons married per 1,000 persons living. This number and rate are the highest recorded since 1921. The number of marriages celebrated by religious ceremony has decreased from 762 per 1,000 marriages in 1924 to 743 in 1929. Civil marriages have increased from 238 per 1,000 marriages in 1924 to 257 last year. A large number of marriages occurred in the third quarter of the year, the number recorded in the July-September quarter being almost double that recorded from January to March.

There were 643,673 births registered in 1929, equivalent to a rate of 16.3 per 1,000 population, which represents a decrease of 16,594 births or a fall of 0.4 in the rate. There were 29,307 illegitimate births, 395 less than in 1928. The proportion of male to 1,000 female births was 1,043, a figure very close to the proportion in recent years and pre-war years. The maximum was 1,060 in 1919.

The number of parliamentary electors on the register was 25,095,793, of whom 11,866,794 were males and 13,228,999 females. This is the first register in which the number of females has exceeded the number of males. There has been an increase of 5.7 per cent in the number of male voters since the previous register, and an increase of

53.1 per cent in the number of female voters.—*Brit. M. J.*, 2: 660 (Oct. 18), 1930.

Infant Mortality in Southern States—A study of infant mortality in 8 representative southern states showed a higher rate there from 1924 to 1928 than in other states of the Union. Of the 44 states in the birth registration area in 1928, ranked according to infant mortality, the relative positions of the southern states studied ranged from Florida, which stood 23d, to South Carolina, 43d. The average infant mortality rate for the birth registration area for 1928 was 67.7; Florida with a rate of 67.2 was the only southern state that was better than the average.

A study of urban infant mortality was more striking. Among 719 United States cities, with an average rate of 68.3, the urban mortality of the southern states ranged from 65 for Florida cities to 117 for South Carolina cities.

The relative positions of these states have changed little in the 5-year period, 1924-1928. The average annual decline in infant mortality in the birth registration area during this period was 0.4. The four southern states which reported for the full 5 years showed average annual declines from 0.64 for North Carolina to 7.72 for Florida.

A further comparative study of 4 typical cities, New York, Cleveland, St. Louis and Los Angeles, with typical southern cities showed a striking contrast. The average infant mortality over a period of 13 years was 75 for New York, 80 for Cleveland, 72.5 for St. Louis and 68.8 for Los Angeles.

These rates compare with 88.6 for Lynchburg, 89.2 for Jacksonville, 91.6 for New Orleans, 99 for Mobile, 107 for Richmond and 113 for Atlanta for the 13-year period.

Infant mortality in southern states is not only higher than in other group sections of the United States but is really higher than it should be when all conditions influencing it are considered. An important factor in the high infant mortality in southern states is the large industrial population made up chiefly of persons of low intelligence and of very poor financial status. The problem is largely one of improving conditions among this industrial population.

An effort toward improving conditions has been made in Durham, N. C., where well baby clinics were established in 1920. In this city of about 45,000 people, there are now 5 clinics, 3 for white and 2 for colored. Their chief aim is to teach mothers the intelligent, watchful care of their infants. Visiting nurses supervise and teach the mothers in their own homes. In 1928, there was a clinic attendance of 3,380, and the mortality was 56.6 for white and 119.2 for colored infants.—B. W. Brooks, *A Study of Infant Mortality in the Southern States*, *South. M. J.*, 23: 869-873 (Oct.), 1930.

Public Health in a Chinese County
—At least one rural county of disease-ridden China is to have modern doctors and nurses and a real health department. The 400,000 inhabitants will be given a chance for healthier and longer lives.

A rural health experiment is to take place in the county of Ting Hsien, which is in the interior of China. The conditions under which the experiment will be carried out will be hard because of the many difficulties encountered, one of which is the political unrest.

There is at present not one physician of the modern scientific school. The

native doctors think disease is caused by heat and wind; sanitation is unknown. Eighty thousand people live in the county's one city, the rest in squalid villages. About 30 out of every 1,000 die each year. The life expectation is only about 35 years.

The health demonstration has begun by educating the natives to come for medical examination, advice and treatment. Vital statistics are being collected and native nurses, midwives and physicians are being trained in modern scientific methods. The Milbank Memorial Fund has given \$50,000 to aid the work. The League of Nations has announced that it will support and cooperate in attempts to modernize China's health service.—*Science*, 72: 14 (Oct. 17), 1930.

Maternal Mortality in the Registration Area: 1929—The Department of Commerce has announced that for the birth registration area the mortality from puerperal causes (7.0 per 1,000 live births) in 1929 was only five-tenths higher than the rate (6.5) for 1927. Puerperal septicemia was affected even less, the rate for 1927 having been 2.5, as compared with 2.6 in 1929, and the rate for "other puerperal causes" was lowered to 0.3 in 1929. These maternal rates were based on the number of deaths among women 15 to 45 years of age per 1,000 live births.

Confining the discussion to only three groups, namely, "all puerperal causes," "puerperal septicemia," and "other puerperal causes," it was found that of the 46 states for which data were available for 1929, South Carolina had the highest mortality rate (11.4), with Alabama and Louisiana next in order (each 9.9), Florida (9.5) and Georgia (9.3). It must be borne in mind, however, that all the states with excessively high rates have large proportions of colored popu-

lations. Singularly, the states with high rates from "puerperal septicemia" are Montana (4.2), Colorado (4.0), New Mexico (3.9), and Arizona (3.8), all with vast rural areas sparsely settled, where hospital facilities and skilled medical care are difficult to procure.

"Accidents of pregnancy" had a rate of only 0.7 for the entire registration area, "puerperal hemorrhage and other accidents of labor," a rate of 1.6, and "puerperal albuminuria and convulsions," 1.8, while the rates in the states for the three causes, respectively, were highest for Vermont (1.3), Delaware (3.0), and South Carolina (4.7). Heretofore the total deaths from these three causes have been under "other puerperal causes."

Of the cities of 100,000 population in 1920, the highest rate for puerperal causes was for Memphis (16.0), followed by Nashville (14.7), and Birmingham (14.4). These three cities have large colored populations. For "accidents of pregnancy" and "puerperal hemorrhage and other accidents of labor," Memphis again takes the lead, with respective rates of 2.3 and 4.3 per 1,000 live births, while for "puerperal albuminuria and convulsions," New Orleans has the highest rate (4.4). The city with the highest rate for "puerperal septicemia" is Nashville (9.0), followed by Memphis (6.1) and Akron and Birmingham (each 5.7).

Among cities which reached 100,000 population at the census of 1930 the highest rate (14.1) for all puerperal causes is for Jacksonville, Fla., followed by Peoria (12.5); Chattanooga (11.9); Evansville (11.8); Knoxville (11.7); Fort Wayne (11.0); and Tulsa (10.8).—U. S. Department of Commerce. Bureau of the Census.

London's Lowest Birth Rate—The lowest birth rate ever recorded in London is announced for the year 1929.

Births in that year numbered 70,089, or 15.8 per 1,000 population against 16.2 in 1928. The number was actually fewer by 887 than in 1918, when the influence of the Great War was at its height. It is estimated that the population of the official "County of London" has decreased from 5,524,000, at the time of the last census in 1921, by 94,000 to 4,430,000 in the middle of 1929. Deaths in the civil population during the year under review numbered 62,889, or 14.2 per 1,000, against 12.1 of the previous year. This increase was due to the influenza epidemic, associated with an unusually rigorous winter, and in addition to the prevalence of whooping cough. Fatal street accidents increased from 747 in 1928 to 814. The report states that there are about 30,000 basement dwellings in London, housing about 100,000 persons, which are not fit for human habitation. It will be noted that the fall in the population of the "County of London" amounting to 2,263 is not due to excess of deaths over births. It is largely due to migration to the outlying parts of "greater London," which still continues to grow.—*J. A. M. A.*, 95: 1515 (Nov. 15), 1930.

Mortality Experience of the First Nine Months of 1930—Never before have such satisfactory health conditions prevailed in the United States and Canada as during the first 9 months of 1930. The mortality record of approximately 19,000,000 persons, the industrial policy holders of the Metropolitan Life Insurance Company, indicates this clearly. This group constitutes about one-seventh of the population of the two countries, and in the past its death rate has proved to be an accurate index of health conditions in the entire population.

The death rate during 1930, to date, has been low in all parts of the United States, as well as in Canada, where approximately $1\frac{1}{4}$ million of the Metro-

politan industrial policy holders live. In the United States, the colored as well as the white population has enjoyed extremely low mortality rates. The cumulative death rate of 8.0 per 1,000 for the whites in both countries is well below the previous minimum of 8.2 recorded in both 1927 and 1921. For the colored, the death rate for the January–September period was 14.6 per 1,000, which is the lowest since 1922. In neither the United States nor Canada has there been widespread epidemic prevalence of any disease so far this year.

Nineteen thirty, moreover, bids fair to be a year of best records, not only in the low mortality rate for all causes combined, but for several diseases which are of major importance—either numerically or in point of public health interest. The outstanding examples are tuberculosis, diphtheria, diarrheal complaints and puerperal conditions. The typhoid fever death rate, also, is running lower than ever before.

The tuberculosis death rate for the January–September period was 82.9 per 100,000 as compared with 89.8 for the same period of 1929. This marks a reduction of 7.7 per cent in a single year. For white policy holders, the tuberculosis death rate now stands at the unprecedentedly low figure of 64.0 per 100,000.

The cumulative death rate for diphtheria during the January–September period was only 5.8 per 100,000 as compared with 8.3 last year—a drop of 30 per cent. Diphtheria in a few years should become an almost negligible item in our mortality statistics. Measles, scarlet fever and whooping cough are also registering lower death rates than for several years past.

The death rate for puerperal diseases has been declining almost continuously

since 1920. The improvement during 1930 has been especially marked, and has been even greater among the insured colored women than among white women. The influenza death rate for the first 9 months of 1930 (15.6 per 100,000) is less than one-third the rate which prevailed during the like period of last year, and the drop for pneumonia has amounted to 17.4 per cent. Important as are the improvements with respect to all other diseases, the declines for these two have been the chief factors in the large drop in the general death rate, in 1930, as compared with 1929.

The death rates for heart disease and Bright's disease are also running well below the figures recorded for the like period of 1929. From the very beginning of the year, the cancer death rate has shown a slight improvement as compared with 1929. There is a fair prospect that, for the first time in 5 years, the year 1930 will mark a break in the persistent year-to-year rise in mortality from cancer. The cumulative death rate for diabetes is a little lower than that for the first 9 months of 1929, but the favorable margin is smaller than that in evidence earlier in the year. There was a marked increase in deaths from diabetes during the third quarter of 1930, and among both white and colored policy holders the death rate was considerably above the third quarter figure for 1929.

Suicides have been considerably more frequent than in 1929. There has been virtually no change in the homicide death rate. Fatal accidents have not been quite as numerous, although the automobile accident mortality rate exceeds slightly that for the corresponding period of 1929.—*Stat. Bull., Met. Life Ins. Co.*, 11: 1–4 (Oct.), 1930.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

The Grab-Net Method, a Process for the Relative Quantitative Examination of Water Fauna—This is an article (in German) describing an apparatus for the collection of littoral fauna, especially designed for collecting hydracarina (mites), without the use of bait. The net is formed of two cones of bolting cloth, like ordinary plankton nets, fitting one into the other. The foremost is 25 cm. in diameter at the mouth, 30 cm. in side length, and tapers to a 2.5 cm. wide opening.

Its forward opening is held by a brass ring and to the apex opening are attached three cords. The second cone has a widest diameter of 12 cm. and is sewn outside the first cone where its width corresponds. It is 35 cm. long and carries a brass ring about 15 cm. from the point where it is attached to the first cone. To this ring are attached the three cords from the apex of the first cone. These are drawn tight so that the opening is triangular.

The frame of the grab-net consists of three brass or wooden rods fixed to the large brass ring in front and bound together below the apex of the second cone, which is closed with a cord attached to the rods at their junction.

For shallow water the grab-net is attached by two of these rods to a pole which is driven into the ground. The net is moved up or down the pole to the required height, and the inlet opening turned in the required direction. In raising the grab-net it is kept horizontal until just below the surface when the mouth is raised slightly. Above the water it is held vertically and dipped several times to half its length under

water to wash the catch to the lower end. The cord closing the apex of the second cone is then opened and the catch emptied into a collecting vessel.

For deep water, instead of the rod, cords are attached to the ends of the frame and tied together so that the grab-net can be raised horizontally. To their junction a long cord with a float is attached. If the frame is of wood a weight is added. The control of the direction of the opening is not generally so important in deep water but can be achieved by a double anchoring of the grab.

The catch is generally easy of examination being free from sludge and plant admixtures. When used for hydracarina, a sufficient number can be collected without use of bait.

The method can also be used for other animals and as the numbers caught depend upon the number present at the place, the time occupied in collection, and the size of the net, the results serve for relative quantitative examination of the population and for the collection of information as to the movements of water animals.—V. Ozolin, *Folia Zoologica et Hydrobiol.*, 1: 279, 1930. From *Summary of Current Literature*, Water Pollution Research Board, England, III, 10 (Oct.), 1930.

The Sewage Treatment Plant of Iserlohn i.W., the First Activated Sludge Plant Worked by Sludge Gas—The sewage plant of the Ruhr Federation at Iserlohn receives the sewage of a population of 19,000. The sewage is generally fresh but receives intermittently loads of septic material

from sewage pits. The Baarbach, into which the effluent flows is small and at times affords no dilution. The original plant consisted of coarse screens, storm water clarification tanks, sand trap and six Emscher tanks. The storm water tanks were planned to prevent overloading and were later retained for the purpose of equalizing the flow to the plant.

In 1927, plans were started for a more complete purification. Contact aerators, for which the gas from the Emscher tanks was used, were inserted in the settling part of the Emscher tanks, but did not achieve sufficient purification, and an activated sludge plant was added. This is the first plant in which the whole power is supplied by its own sludge gas. Purified sewage is used for cooling in the gas engines and when thus heated is used to heat the sludge in the Emscher tanks.

An illustrated description is given of the plant as extended. Oil and grease are removed in the sand trap by dipping baffle walls and in a new aerated tank after the sand trap. The contact aerators are retained in the Emscher tanks to prevent the intermittently septic state of the sewage from damaging the activated sludge process. The aerators, aeration system and cleaning of the tanks are described.

The secondary settling tanks of both this and the activated sludge tank are provided with central inlets which lead the sewage directly to the lower half of the tank. The activated sludge tanks are on the plan of those at Essen-Rellinghausen, with compressed air and stirrers. From the settling tank part of the sludge is returned to the activation tank and part, with the sludge from the contact aerator plant, enters the Emscher tanks. The method of collection and utilization of gas, the power requirements, the precautions taken to avoid any interruption of the process and the

costs of building and operation are discussed.

The plant has been in operation since August, 1929, and though some disturbance of the activated sludge process has been caused by the intermittent septicity of the sewage already referred to, the operation has been otherwise satisfactory.—W. Schmidt, *Tech. Gemeindebl.*, 33: 133, 1930. From *Summary of Current Literature*, Water Pollution Research Board, England, III, 10 (Oct.), 1930.

Current Conceptions of Sewage Disposal—Here are presented a brief review of developments in the practice of sewage disposal and a consideration of the theories and arguments upon which various processes have been based. The author discusses the development of the biological treatment of sewage, the relative efficiency of land treatment, biological filtration, and the activated sludge process, and methods of aeration and stirring.

The efficiency of the biological treatment depends upon: (1) the closeness, frequency and duration of interfacial contact between the biologically active medium and the sewage; (2) adequate available air; and (3) mechanical efficiency. The biological efficiency of the activated sludge process is high but the mechanical efficiency of the various methods is low. It has been found that the "mechanical" systems of activated sludge treatment provide motion and mixing with efficiency and economy, but that the "diffused-air" system gives the highest aeration efficiency. Investigations are being carried out on the combination of the two systems.

The provision of the necessary oxygen with which to speed up the natural process is considered, special mention being made of Kessener's method of aerating a strong slaughter house waste by means of circulating brushes, the pre-aeration

of sewage, and the elimination of quiescent zones in aeration tanks. The enzyme theory of biological purification is discussed and the possibility of reducing the activated sludge processes to stage treatment using different sludges for preliminary and final treatment is considered. The Dorr clarifier and the Pruss sedimentation tank are briefly described and the advantages claimed for them enumerated. Preliminaries to sedimentation are discussed with special reference to devices for the removal of grit from detritus tanks and to automatic screening apparatus.

Modern methods of sludge treatment by filters and of digestion are briefly dealt with. Sludge digestion, which may be two- or one-stage, depends essentially on control of temperature, reaction, sludge proportion and mixing. The design of works and the need for improving existing works esthetically is mentioned. The article is illustrated by photographs and diagrams.—T. P. Francis, *Surveyor*, 77: 549 and 583, 1930. From *Summary of Current Literature*, Water Pollution Research Board, England, III, 10 (Oct.), 1930.

Water Contamination from Pump Packing—This paper, presented at the 50th Annual Convention of the American Water Works Association, St. Louis, deals with the contamination of three two-stage centrifugal pumps and with the remedy. A description is given of the bacteriological tests and observations made on samples of the water taken from the pumps, service main, and distribution system. Coli-aerogenes contamination occurred after the pumps were repacked. Disinfection of the pumps by secondary chlorination failed to correct this condition.

Studies were made of the packing used and of the bacterial quality and residual chlorine content of the water which dripped continually from the

packing glands. The unused packing and tallow expressed from it were free from coli-aerogenes, but samples of water taken from the first and second stage glands were contaminated. E. C. York pointed out that the drippings from the glands did not represent all of the water which was introduced at the water seal, because some of it must necessarily find its way past the inner rings of the packing in an inward direction and hence into the suction chamber of each stage since the pressure at that point is less than that of the applied water. He suggested that the pressure line be abandoned as a source of supply for the water seal, so that all the water drippings from the glands would have to pass from the suction chamber of each stage in an outward direction and so possible contamination of the water leaving the discharge of the pump would be avoided. This suggestion was adopted and proved a successful solution of the problem.

Various observations made from the experiments are enumerated and references to the literature are given.—A. F. Mellen, *Canad. Eng.*, 58: 693, 1930. From *Summary of Current Literature*, Water Pollution Research Board, England, III, 11 (Nov.), 1930.

Operating Experiences with a New Automatic Residual Chlorine Recorder and Controller—Automatic chlorinating equipment has so far been able to compensate for changes in flow, but not for variations in the chlorine demand of the water. A chlorine control equipment should adjust dosage automatically according to flow changes and to chlorine demand and provide a legally acceptable 24-hour record.

A new automatic residual recorder and chlorine controller is described and its fulfilment of these functions discussed. The equipment is simple in design and operation, and works on an

intermittent system wherein a record is made, chlorine dosage adjusted and everything turned off for a period of time before a new cycle is started.

A detailed and an illustrated description of the equipment for each part of the cycle is given. There are four principal parts to each cycle: (1) A suitable source of light provides illumination which, passing first through a standard solution and then through the solution to be tested, enables a photoelectric cell to measure and compare the color of the solutions. This comparison is expressed by an angle on a rheostat. (2) The angular difference is mechanically transferred to contact levers and the electrical connections are transferred to a chart and to the electrical device operating the chlorinator. (3) The recorder device draws a single line when the standard and residual tests are the same, but any difference energises a plus or a minus magnet and causes short lines at right angles to be drawn. The length of these represents both the difference between residual and standard and the amount of adjustment made by the chlorinator. The chlorinator is a standard automatic vacuum type adapted to electrical control. (4) In the last part of the cycle, provision is made for washing out the old solution, refilling the containers and adding orthotolidin to one of them so that color may develop before the opening of the next cycle. The operation of this equipment in practice in two installations is described.

The equipment can also be adapted to

give warning of approaching pollution in a stream by locating the machine up stream and the chlorinator far enough down stream to protect the supply. Experiments are also being made to apply the machine to hydrogen ion control, and it could be used in the regulation of turbidity or natural color.—J. W. Cutler and F. W. Green, *J. Am. W. W. Assn.*, 22: 755, 1930. From *Summary of Current Literature*, Water Pollution Research Board, England, III, 11 (Nov.), 1930.

Treatment of the Waste Waters of Slaughter and Cattle Yards—The waste waters of the slaughter yards at Cologne are treated in a mechanical clarification plant with screens of 10–20 mm. mesh. Blood wastes are collected separately and utilized. The sludge is collected and removed by an endless carrier and is taken over by a contractor, composted, and used as fertilizer. The clarified waste water enters the city sewers.

The author then refers briefly to the effects of more complete treatment processes, filtration, chemical treatment by lime, and by lime with metal salts, biological processes by filtration or digestion, and irrigation, and describes the conditions of situation and disposal facilities for which the different treatments are suitable.—Butzler, *Gesund. Ing.*, 53: 391, 1930. From *Summary of Current Literature*, Water Pollution Research Board, England, III, 11 (Nov.), 1930.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., PH. D., AND LEONARD GREENBURG,
M. D., PH. D.

Report of the Committee on Nomenclature in Occupational Disease as Affecting Standard Practices in Workmen's Compensation—An essential factor in the compensation for occupational diseases lies in a definite and acceptable terminology for these diseases. Compensation boards have awarded compensation for cases ranging all the way from such definite occupational diseases as anthrax or lead poisoning to tuberculosis, appendicitis, and influenza, etc. Report No. 61 of the National Industrial Conference Board, 1923, shows the wide range of afflictions compensated as occupational diseases in the various states in the case of 80 awards made, and the much wider range of claims for compensation from miscellaneous diseases.

A perusal of the New York State Court Decisions in which compensations have actually been made from May, 1923, to August, 1929, shows a list of 76 medical afflictions, of which examples are duodenal ulcer, diabetes, hemorrhoids, rheumatism, apoplexy, anxiety psychosis, hysteria from fright (without injury), Basedow's disease, glaucoma, asthma, pulmonary tuberculosis, tuberculous meningitis, etc.

An accompanying chart of state laws shows the attitude toward the compensation of diseases resulting from or aggravated by accidental injury (taken from *Digest of Workmen's Compensation Laws*, 1927, Workmen's Compensation Publicity Bureau, New York City). Some 37 states allow compensation for cases of disease resulting approximately from accidental injury; 5 states, Hawaii,

and the federal departments allow compensation for any injury proximately caused by and arising out of employment, or resulting from the nature thereof, including diseases; California and Connecticut compensate for the aggravation by injury of preëxisting disease; while 2 states, Connecticut and Kentucky, specifically exclude compensation for the aggravation of preëxisting disease. In practically every state the departments of labor, upheld by the courts, have permitted compensation for disease aggravated, accelerated, developed or hastened by accident.

Obviously legislation is far behind the compensation boards and courts, and it is felt that the inability to agree on the definition of occupational diseases and related terms is a chief difficulty. A search of standard textbooks shows also that even the experts do not agree (Weyl, Glibert, Bourgeois, Paillet), nor do various national committees (Italian, Swiss, etc.).

In Great Britain the Committee on Compensation for Industrial Diseases adopted the following criteria for the inclusion or omission of certain diseases in the occupational disease schedule:

1. Is it outside of the category of accident and disease covered by the act?
2. Does it incapacitate for more than a week?
3. Is it so specific to the employment that causation by the employment can be established in individual cases?

The most acceptable definition of occupational diseases from the medical point of view is, "All diseases which occur with unusual frequency in a deter-

mined occupation." Since the medical point of view may differ from the legal point of view, the committee recommends the following definition: "Occupational diseases shall be defined as those disease conditions in which the employment is the proximate cause." The definition requires a corollary to clarify it in the form of an acceptable classification, as follows:

1. Diseases caused by the inhalation of dust from:
 - (a) Mechanical obstruction of air passages
 - (b) Laceration of mucous epithelium
 - (c) Conveyance of soluble toxic material
 - (d) Conveyance of germs in dust
2. Diseases caused by industrial poisons such as:
 - (a) Poisons which act superficially, as irritant or corrosive (chlorine)
 - (b) Blood poisons (as carbon monoxide, or anilin)
 - (c) Poisons with definite internal or specific effect (lead, arsenic)
3. Diseases caused by fumes, gases, and vapors (poisonous and non-poisonous)—phosgene, metal fume, carbon dioxide
4. Diseases caused by extremes of temperature (heat stroke and exhaustion)
5. Diseases caused by harmful bacteria and microorganisms (anthrax)
6. Diseases caused by compressed or rarified atmospheres (caisson disease)
7. Diseases caused by improper lighting (miner's nystagmus)

The important consideration from a medico legal standpoint is to establish the occupation as the proximate cause of the disease suffered by the worker. This relationship should be determined by medical rather than lay opinion. Present abuses will not be remedied where lay referees arbitrate medical questions (case examples cited).

In the specific use of terms, correct spelling becomes essential.

Due to the difficulty which arises in naming a given occupational affliction by naming the agent which caused it or the disease entity which resulted, the committee has taken up some 25 of the

commoner occupational diseases and attempted to define them with certain explanatory notes (these are the afflictions commonly seen in the usual state schedules of occupational diseases).

(This report, made at the Fort Worth Meeting, was referred to a larger committee of the A. P. H. A., which is working in conjunction with the U. S. Bureau of Census.)—Henry H. Kessler, *Chairman*, May R. Mayers, Irene Rantoul, Bernard S. Coleman, Emery R. Hayhurst, and R. R. Sayers. 27 type-written pages, 2 infolded Tables: 1930. E. R. H.

Public Health Aspects of Atmospheric Pollution (a Summary)—One can go for days without food; one may even do without water for a considerable number of hours; but it is a matter of minutes when it comes to the necessity of breathing uncontaminated air with the requisite amount of oxygen. Perhaps the whole problem of the public health aspects of atmospheric pollution is contained within these sentences.

SOURCES OF ATMOSPHERIC POLLUTION

These may be briefly described under general headings as follows:

1. The combustion of fuels
2. Chemical processes producing noxious gases
3. Animal and plant emanations
4. Miscellaneous causes

In general, atmospheric contamination may be caused by the dissemination of dusts or solid particles, gases, or vapors.

EFFECTS ON THE PUBLIC HEALTH

All grades of severity have been observed, from the mildest type of irritation of the upper respiratory tract to well developed acute manifestations, some of which result in death.

Although the greater number of effects have been observed to produce minor changes in the health and effi-

ciency of individuals exposed, the mortality from poisonous gases and injurious dusts has been steadily increasing within recent years.

This fact nevertheless gives an encouraging aspect to the situation, inasmuch as mortality has in the past served as a better stimulus to concerted action than morbidity.

THE REMEDY

It is a fact that men have always paid more attention to food and drink than to the air which they breathe, in spite of the greater importance of oxygen to the body. Perhaps primeval man in his struggles for existence has built up and sent down to us a series of conditioned reflexes, causing us to take more thought for the food and water supply than for our atmospheric environment.

This may be the reason for our accomplishments in the field of the regulation of water, milk, and food supplies. The mechanism through which these changes have been brought about is by education of the public and regulatory legislation. These same means are at our disposal in the solution of the problem of atmospheric pollution. It is my belief, however, that much more can be done by the dissemination of adequate information than through the passage of laws.

The basis for organization of this work now exists within the American Public Health Association. Engineers, sanitarians, and physicians should collaborate in the working out of safety standards applicable to all conditions in which pollution of the atmosphere occurs.

Finally, one need not look far to see that great good has been accomplished in similar fields by various groups, such as commissions on ventilation, milk commissions, and others. Why not, then, a commission on atmospheric pollution?—C. O. Sappington, National

Safety Council, Chicago. Read before the Joint Session of Sanitary Engineering and Industrial Hygiene Sections of the A. P. H. A., Fort Worth, Tex., October 30, 1930. E. R. II.

The Medical Aspects of Atmospheric Pollution—The health of all higher animals is affected in direct proportion to the concentration of a given pollution in the atmosphere they breathe. Among the common gaseous pollutions are carbon monoxide, gasoline, the gases of mechanical refrigeration, and, especially in the Texas field, hydrogen sulphide from the crude oil containing sulphur compounds.

Where natural gas is used for fuel there is not so much pollution by the suspension of solid particles in the air, and consequently the ultra-violet rays are not obstructed as in coal burning districts. As has been shown by Shrader and others, this has a direct effect on the incidence of bacteria in the air, which reaches a peak of contamination when ultra-violet rays are least. In 1926, Meller reported upon the result of 10 years' enforcement of smoke control in Pittsburgh and found that while the smoke solids had been reduced approximately 70 per cent, the total deposits had increased about 40 per cent. Thus one type of pollution was reduced, but another substituted.

From the medical viewpoint pneumoconiosis due to the breathing of carbon particles and other materials in the air, and silicosis from the inhalation of silica, both of which are materially increased in industrial centers, are matters of constantly increasing interest and concern. Air-borne bacteria in dust are considered slight menaces but the condition is different in the case of droplet infections in the air of a room occupied by a tuberculous patient.

It has been noticed that after a windy day, an epidemic of coughs and colds

often develops. These may be due to the irritation of the wind, dust and pollens, with subsequent bacterial infection. Balyeat reports that approximately 3,000,000 people in the United States suffer from hay-fever and asthma, largely due to wind-borne pollen. Such pollens might be greatly reduced by state and municipal legislation regarding the cutting of weeds and grasses. Many states have legislation providing for the destruction of certain weeds detrimental to agriculture, and these pollen-producing obnoxious plants should be similarly legislated against. The pollen content of the air in the Southwest is much greater than in the North and East. Thus a pollen count of from 6,000 to 7,000 or higher is common with us. The problem is also before us about 12 months of the year: The trees early in the spring; the grasses in the spring and summer; the amaranths and the Russian thistle or tumbleweed from July until frost; the ragweed from the early part of August until frost; and the mountain cedar which begins to pollinate early in December and continues through February. The lack of a moderate amount of rain through October and November shows greatly increased counts in pollen plates, particularly for the ragweed.—T. C. Terrell, M.D. The above is an abstract of the paper presented before the Joint Session of the Sections on Sanitary Engineering and Industrial Hygiene Sections of the A. P. H. A. at Fort Worth, Tex., October 30, 1930. E. R. H.

Effect of Noise on Hearing of Industrial Workers—In this study the acuity of hearing of 1,040 workers in 7 factories was studied. In these factories there were found to be different degrees of noise, varying from those which were comparatively quiet to those which were comparatively noisy. As a control group, a number of employees

of the New York State Department of Labor and the New York State Insurance Fund were examined.

The test instrument was a 3-A audiometer supplied by the Bell Telephone Laboratories. In the present study an arbitrary standard of a loss of ten sensation units was selected as the basis for the differentiation of normal from pathological cases. The amount of noise in the workrooms was measured by a 3-A audiometer also. Of 1,040 persons examined, 76 per cent were found to be possessed of normal hearing. Of the 23.7 per cent who were found to have defective hearing, only 14.9 per cent lacked a previous history of some aural condition which might have been a predisposing factor. Of this group (14.9 per cent) the greatest incidence of deafness was found among workers subjected to the greatest amount of noise. Ninety-six out of a total of 367 workers in that group of plants wherein the noise was between 60 and 80 units were found to be suffering from deafness with no other apparent causative reason than the noise in their environment. There is some evidence that the deafness increased in the older age groups.

It is recommended that, wherever possible, tests of hearing should be made on all employees at the beginning of employment followed by periodic re-examinations when the workers are subjected to more than a moderate amount of noise, and that certain types of noise producing machines be isolated.—*Special Bulletin No. 166*, New York State Dept. of Labor, Bureau of Women in Industry, 1930. L. G.

Medical Care for 15,000 Workers and Their Families—A Survey of the Endicott Johnson Workers Medical Service, 1928—The Endicott Johnson Corporation is one of the world's largest manufacturers of shoes and tanners

of leather. Its factories are located in New York State. In 1918 the management extended medical service to all of its employees. In all, 100 professional and lay workers are employed in the medical department taking care of approximately 34,000 patients yearly and costing slightly less than \$900,000.

The present study indicates that 77 per cent of the workers and their dependents made use of this service exclusively for themselves and their families, and that an additional 17 per cent used it in part. The cost per individual in families which actually used the service was \$25.49 per annum.

This medical organization was studied by Dr. Nellis B. Foster, Dr. Ransom S. Hooker and Dr. Michael M. Davis. In a word, the findings of these investigators may be summed up by saying that the service is on a level with that rendered by the private physicians in the communities in which the plants are located. Dr. Foster found the clinical records of internal medicine somewhat scant. Dr. Hooker found a lack of stimulating leadership and a lack of detail in and coördination of records, while Dr. Davis found certain defects, the correction of which is a matter of sound planning and execution. Aside from these minor criticisms, the service has been found highly satisfactory.—The Committee on the Costs of Medical Care—*Publication Number 5*. L. G.

Workmen's Compensation Legislation—Among the bills which were passed on occupational diseases was one in New York, adding to the list of compensable diseases radium poisoning, or disability due to radio-active properties of substances or to roentgen rays, and disability from blisters or abrasions, from bursitis or synovitis, or from dermatitis or dermatosis. Five defeated bills in New York included one which proposed to designate as occupational

diseases any and all disabling diseases and disabling illnesses contracted in any of the employments coming within the act; another, that "the disablement of an employee resulting from an occupational disease arising out of his employment shall be treated as the happening of an accident within the meaning of the law." Another defeated bill proposed to substitute the term "metal chills," as a name for a listed occupational disease, for the term "zinc poisoning or its sequelae." Still another unsuccessful bill proposed to classify as an occupational disease any disabling disease from pathogenic microorganisms, viruses or toxic substances, acquired by coming into contact with them in a pathologic or bacteriologic laboratory while employed.—*A. M. A. Bulletin*, 25, 7: 158-159 (Oct.), 1930. E. R. H.

Silicosis Among Rock Drillers, Blasters and Excavators in New York City, Based on the Study of 280 Examinations—This is a report of a study of silicosis among New York City rock drillers, conducted by the New York Tuberculosis and Health Association and the DeLamar Institute of Public Health of the College of Physicians and Surgeons of Columbia University, under the direction of a Silicosis Committee of the New York Tuberculosis and Health Association.

The dust studies made in conjunction with this research were conducted by the Industrial Hygiene Laboratories of the Metropolitan Life Insurance Company of New York City, the funds for the study being provided by the Altman Foundation. The report consists of 5 parts: (1) the introduction, (2) a study of the clinical aspects of the problem, (3) a study of the dust content of the air in rock drilling and blasting operations, (4) conclusions, and (5) recommendations of the committee.

The clinical aspects of the study were

conducted by Dr. Adelaide Ross Smith of Columbia University. In this portion of the study, 230 men were examined and X-rayed, but 22 cases were discarded, leaving a total of 208 cases for the complete study. Forty-three per cent of the workers were found to be negative; 23 per cent were found to be suffering from ante-primary silicosis; first stage silicosis included 19 per cent; second and third stage silicosis, 15 per cent. With reference to the duration of exposure, it was found that second and third stage silicosis did not begin to occur until a 5-9-year working period and it was at its maximum occurrence in the 20-29-year working period. First stage silicosis occurred in less than 2 years and had a high incidence between 2 and 4 years.

With reference to symptomatology, cough, dyspnea, and pain in the chest were found to be of frequent occurrence among workers suffering from all stages of silicosis. Ten per cent of the total number of workers were found to have heart disease of some type. Blasters, rock drillers and excavators were affected by the disease in frequency and severity in the order named. Second and third stage silicosis occurred four times as frequently among those who had done underground work as among those who had only done open excavation.

The dust studies were performed by J. W. Fehnel, Chemist for the Metropolitan Life Insurance Company. These

studies indicate a free silica content of from zero to 84 per cent; a total silica content of from about 56 per cent to 94 per cent with a total number of dust particles of from 2 million to 17 billion per cu. m. of air. The conclusion that rock drillers in New York City are exposed to a dangerous dust, great in quantity, is apparent.

The committee recommended that remedial measures are urgently needed in this occupation; that efforts must be made immediately to improve the conditions by dust control technic, and that compensation should be granted for disability due to silicosis.—*J. Indust. Hyg.*, XI, 2 (Feb.), 1929. L. G.

Bibliography on Industrial Fatigue and Allied Subjects—This is a supplement to the second edition of the *Report of the Committee for the Study of Industrial Fatigue of the Industrial Hygiene Section*, including material through May, 1930, and consists of a printed bulletin of 11 pages, arranged by authors in alphabetical order with a line or two of abstract material under each citation.

Those interested in the *Bibliography* should address either Dr. Eugene L. Fisk, Chairman of the Committee (Medical Director, Life Extension Institute, 25 W. 43d St., New York, N. Y.), or Dr. Carey P. McCord, Section Secretary (Director, Industrial Conservancy Laboratories, 34 W. 7th St., Cincinnati, O.).

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Vitamins A and D in Fish Oils—Experiments in the past have shown that fish oils contain varying amounts of vitamins A and D. In view of the importance of these oils in animal feeding and the fact that both the quality and quantity of the oils can be increased, a more thorough study was undertaken by the Bureau of Chemistry and Soils of the U. S. Department of Agriculture in coöperation with the Bureau of Fisheries, of the U. S. Department of Commerce. Commercial oils—salmon, sardine (California pilchard), menhaden, Alaska herring, Maine herring, and tuna—were used and the method of manufacture and origin were known.

In testing for vitamin A, the first tests were carried out on 32 albino rats, divided into 8 groups. Two groups were used as controls; one received the basal diet only and the other received 10 mg. per rat daily of a medicinal cod liver oil of high vitamin A potency. The remaining group received 10 mg. daily of each of the oils to be tested. The oils were diluted with peanut oil so that 0.1 c.c. of oil carried the desired daily dose. Of the oils tested, salmon oil was the only one that falls in the same class with cod liver oil. The groups on tuna and salmon oils survived longer than the control and did not develop severe ophthalmia so rapidly, indicating that these oils contain vitamin A. To obtain a more accurate comparison between cod liver oil and salmon oil, three groups (6 rats each) were fed daily doses of 5 mg. of cod liver oil and 10 and 20 mg. of salmon oil. It was found that salmon oil had one-third the vitamin A potency of

the cod liver oil. Sardine, Alaska herring, and tuna oils were found to be about one-tenth as potent as cod liver oil. Maine herring was about one-half as potent as Alaska herring oil and menhaden oil was found to contain no vitamin A.

In testing for vitamin D, rats 4 weeks old and weighing 60 to 65 gm. were put upon Steenbock Diet 2,965. In 23 to 25 days the oil to be tested was added to the diet and after 10 days the animals were killed and their bones examined for healing of the rachitic metaphysis. If the arbitrary figure of 100 is assigned to the vitamin D value of cod liver oil, the oils tested have the following vitamin D values: tuna, 125; sardine, 100; menhaden, 75; salmon, 50; Alaska herring, 30; and Maine herring, 15.—E. M. Nelson and John Ruel Manning, *J. Indust. & Eng. Chem.*, 22: 1361 (Dec.), 1930.

Observations on a Diatom (Nitzschia Closterium W. Sm.) as a Source of Vitamin A—Although previous experiments have indicated that the oil of Nitzschia Closterium, a marine diatom, is potent in vitamin A, it did not give the color reaction and it was, therefore, decided to repeat the experiments and also get a more quantitative estimate of the activity of this diatom. The oil was studied both biologically and colorimetrically. It was found rich in natural plant pigment, chlorophyll, xanthophyll, carotene, and fucoxanthin and gave a blue color reaction with SbCl_3 . The results of this experiment lead to the suggestion that these diatoms are the ultimate source of vitamin A of the fish-liver oils and that a

similar change. takes place in the cod giving rise to the stores of colorless vitamin A present in the liver oils, and also explains why liver oils of fish may be very pale in color and at the same time very rich in vitamin A.—Bashir Ahmad, *Biochem. J.*, 24: 860, 1930.

Fat Soluble Vitamins. Butterfat: Its Antirachitic Properties and its Artificial Activation—In the past it has been shown that the antirachitic potency of many oils and fats including butterfat can be increased by irradiation. The experiments here recorded concern the conditions necessary to secure maximum activation of butterfat. For the experiments, 50 lb. of June butterfat were used. For the irradiation, an Alpine Sun Lamp was used for the most part but in some of the experiments a Cooper-Hewitt mercury vapor lamp of the B. Y. type was used. The distance of exposure was kept at 18" and in no case was the temperature allowed to exceed 50° F.

Using a film of fat 160 mm. thick, most of the activation by exposure to the ultra-violet radiations of the apparatus occurred in the first 10 minutes of exposure or less. The second 10 minutes caused additional activation, but the effect of the third 10 minutes was questionable. After that, irradiation for a total of 2 hours or more caused no increase. When radiation was continued for a total of 16 hours, the activation originally induced or originally found in the butterfat was totally destroyed. The activating strength of the two types of lamps was found to be approximately equal.

June butterfat was found so low in vitamin D that 5 per cent of the weight of a rickets producing ration or an intake of about 400 mg. per rat daily did not allow normal bone production. It did, however, contain sufficient activatable constituents so that treatment with ultra-violet radiations under suit-

able conditions made an intake of 20 mg. of it per rat daily equivalent in antirachitic potency to 400 mg. of the untreated. A sample of cod liver oil was found about 40 times as potent as the June butterfat. The potency of irradiated butterfat was found stable to storage, and no deleterious effects of judicious irradiation were detected. It is concluded that it is practicable to activate butter by the introduction of irradiated ergosterol.—H. Steenbock and Alice M. Wirick, *J. Dairy Sci.*, 13: 497 (Nov.), 1930.

Meat in Nutrition—I. Preliminary Report on Beef Muscle—Meat, like milk, has been subjected to varied tests to determine its rôle in nutrition. This paper describes the growth, reproduction and lactation performances of three generations of albino rats on a diet in which the main protein constituent was lean muscle beef. Excellent growth and reproduction were secured in rats consuming a meat ration supposedly sufficiently fortified with the necessary vitamins and mineral matter. Cannibalism and failure of the milk supply were frequent occurrences among the rats fed the meat ration, but no difficulties were encountered with the rats fed the control ration. No noticeable results were observed when the meat ration was modified by increasing its yeast salt mixture and protein contents.—P. Mabel Nelson, Margaret H. Irwin, and Louise J. Peet.

II. Some Dietary Factors Influencing Lactation—This experiment was carried through three generations to discover what constituents should be added to the basal meat diet to obtain successful lactation. While the meat ration proved suitable for growth and reproduction, it failed to meet the needs of the mother during lactation. The diet modified by the addition of tikitiki and wheat germ oil, and the control basal diet were least efficient in maintaining

the weight of the mothers during lactation. Mothers on the increased meat diet plus 15 per cent yeast weaned the largest percentage of the young born in the three generations, but in the first and second generations an even larger percentage was reared by the mothers fed the basal diet with the autoclaved yeast addition.—Louise Jenison Peet, P. Mabel Nelson, and Erma A. Smith.

III. Hemoglobin Formation—Since further confirmation of the adequacy of a ration may probably be obtained by a determination of the percentage concentration of the hemoglobin of the rats on the ration, the number of gm. of hemoglobin per 100 c.c. of blood was determined for the young of the rats on the different diets used in the experiments reported in experiment II. Tables are given showing the hemoglobin determinations. The diets which contained an increased percentage of yeast, autoclaved yeast, tikitiki, lemon juice, or wheat germ oil, led to significantly greater hemoglobin formation in the young than the diets containing increased protein.—Louise J. Peet, Erma A. Smith, and P. Mabel Nelson, *J. Nutrition*, 33: 303 (Nov.), 1930.

Does the Nickel Dissolved from the Container During Pasteurization Catalyze the Destruction of the Vitamins of Milk?—Since nickel is used more extensively in industrial machinery than is copper, and since in previous years the work of Hess (*J. Indust. & Eng. Chem.*, 13: 1115, 1921), and Hess and Weinstock (*J. A. M. A.*, 82: 952, 1924) suggested a catalytic destruction of vitamin C in milk by copper, this experiment was undertaken to determine if nickel catalyzes the destruction of vitamins in milk. In the experiments 390 rats and 140 guinea pigs were used. Vitamins A, B, and C were studied and three groups of rats were fed a ration otherwise adequate and supplemented by raw milk, milk

pasteurized in glass, and milk pasteurized in nickel. The nickel content of milk pasteurized in a nickel container was found to be 15 p.p.m. nickel while the same milk pasteurized in a glass vessel contained no nickel.

There was no appreciable destruction of vitamin A by pasteurization in either glass or nickel.

The antineuritic factor of the vitamin B complex was partially destroyed by pasteurization but there was no evidence of a catalysis of the destruction by nickel.

Vitamin C was partially destroyed by pasteurization but it was not shown that nickel increased the destruction.

After studying the rate of development of deficiency diseases, acuteness of symptoms, autopsy findings, and growth curves, it is not indicated that nickel dissolved from the container during pasteurization catalyzes the destruction of vitamins A, B, or C during pasteurization.—Avery D. Pratt, *J. Nutrition*, 3: 141 (Sept.), 1930.

An Unusually Mild Recurring Epidemic Simulating Food Infection—In various localities of the northwest mountainous section of the United States, particularly in certain of the national parks, although never limited to these areas, a mild dysentery-like epidemic has occurred from year to year during the hottest and driest months of the year. In 1929, there was a large number of cases in Yellowstone Park affecting both employees in the park and tourists. The symptoms were practically identical—nausea, vomiting, sharp pain in the abdomen and diarrhea with rapid recovery. It was estimated that at least one-half the employees throughout the park including hotel employees, storekeepers, forest rangers and others were stricken with the illness. Tourists stopping at hotels and those camping were affected. Although the symptoms were those of food poisoning

there was no common item of food. It was learned that a similar illness was prevalent at Livingston, Butte, Missoula, and Hamilton, Mont.

During 1930 there was a recurrence of the outbreak and the author personally saw 38 cases and obtained records of the occurrence and the symptoms of 57 others. There were undoubtedly additional cases in Yellowstone Park during that summer. Blood cultures and throat cultures from those affected yielded no pathogenic organisms. The serums from 6 cases were tested against a number of common food poisoning organisms. In 2 cases agglutinations were obtained with *B. dysenteriae* (Shiga)—one in a dilution of 1: 160 and the other in a dilution of 1: 320. All other serological tests were negative. The water supplies were free from contamination; sewage was properly and carefully disposed of; and the sanitary conditions surrounding the handling of food were beyond criticism. Food supplies for the various hotels and camps were obtained from different sources. The milk used was pasteurized and the meat and other perishable foods were transported to the park in refrigerator motor trucks. In-

vestigation disclosed that the Yellowstone hotels and lodges do not use a manufactured silver polish which might be considered a possible cause of illness. Many people attributed the sickness to the pine pollen. This was disproved.

Comparison of the symptoms with those of botulism, bacillary dysentery and food infections due to the paratyphoid-enteritidis group of bacteria showed that there was no similarity to botulism, some suggestions of bacillary dysentery, but a closer resemblance to paratyphoid-enteritidis infection.

The inability to connect the cases with infected food rather disproves the theory that the paratyphoid-enteritidis group might be the causative agents. The above considerations, especially the definite agglutination of *B. dysenteriae* (Shiga), suggests the possibility that these epidemics are either mild outbreaks of bacillary dysentery, caused probably by an attenuated strain of the Shiga type of organism, or else an unknown organism belonging to the same group. Why the condition does not spread to the large centers of population in the East remains unexplained. —R. R. Spencer, *Pub. Health Rep.*, 45: 2867 (Nov. 21), 1930.

CHILD HYGIENE

RICHARD A. BOLT, M. D., DR. P. H.

THIS section aims to present in general outlines the fundamental factors which condition the health of mothers and children. It will attempt to integrate child hygiene with the social, economic, educational, and public health movements of the times as illustrated by actual field experiences. The relative values of the various phases of the subject will be discussed, and criterions of effectiveness set forth.

It is hoped that every member of the Association, and especially those of the Child Hygiene Section, will take an active interest in the development of these columns and send in current reports of promising work, new features of child hygiene programs, and results of local child health activities. Material and suggestions for the betterment of this section will always be welcomed.

In reopening the Child Hygiene Section it seems desirable to present a statement as to the scope and interrelations of this subject. An outline of a tentative plan for presentation of current material as it may be brought to the attention of the editor from month to month is sketched in this issue. It is planned to record not only the progress of child hygiene as illustrated by outstanding pieces of local work, but also to give coherence to this material by indicating its bearing upon a general community program for maternity and child health.

Child hygiene is an integral part of the public health. It is intimately related to sanitation of the environment on the one hand, and on the other, with even greater force, to personal hygiene of the child applied directly in the home and community. In a somewhat re-

stricted sense child hygiene was formerly considered to cover only the prevention of disease and correction of remediable defects. Within the last decade its meaning has been broadened to include all health activities for the welfare of both mother and child. This is reflected in the newer term, child health, which brings together two strong Anglo-Saxon words conveying the idea of wholeness or fullness of life for the child. It connotes mental and bodily vigor, strength, alertness and buoyancy as well as prevention of disease.

Maternity and child health cannot be separated. The mother is the fostering environment of the child for many months. Madonna and child are the true type of affectionate care. The preservation of this tender relationship is one of the main objectives of child health work. No child hygiene plan can be considered complete unless linked to the protection of maternity.

Child welfare is a term loosely used to cover every phase of social work dealing with the child. The present-day tendency is to apply it to many diverse activities, including health, education, recreation, physical training, mental hygiene, and prohibition of child labor, as well as to the care of dependent, delinquent, and handicapped children.

In this section, child hygiene and child health will be used interchangeably to designate the significant features of public health activities, official, semi-official and voluntary, aimed to protect, promote, and conserve the health of children from the time of conception through adolescence. While it is not possible in actual experience to segment

the child's life, it will be convenient, for purposes of periodic presentation and discussion, to consider the essential elements of child welfare activities under a number of well recognized divisions which more or less overlap or interdigitate. These are as follows:

1. *General Public Health Measures* which have a direct or indirect bearing upon the health of the mother and child, e.g., the control of communicable diseases, the protection of water and milk supplies, and public health nursing.

2. *Maternity Welfare* which provides for adequate prenatal care, skilled obstetrical service, nursing and ample hospital facilities for maternity care.

3. *Infant Hygiene* with community measures for the prevention of early and late infant mortality, and instruction of mothers

in the proper care of their children.

4. *Preschool Child*—Provisions for prevention (including suitable immunization) of diseases and the correction of remediable defects. This is the period of relatively low mortality but high morbidity and damage which may affect seriously the future career of the child. Health habits are most easily inculcated at this time.

5. *School Health* should be assured by thorough physical examination of every school entrant, provision for correction of defects, prevention of communicable diseases, compliance with a hygienic school regimen and development of health education.

6. *Health of the Child in Industry*—Careful supervision of children entering any industrial employment; issuing of working papers only after a thorough physical examination and a determination as to whether the work offered will bring about any injury; prohibition of child labor in dangerous or deleterious occupations.

DECLARATION OF PRINCIPLES EVOLVED FROM THE WHITE HOUSE CONFERENCE ON CHILD HEALTH AND PROTECTION

AT the final meeting of the White House Conference the following summary of principles was adopted as an introduction to the four reports presented by the chairmen of the different sections. It was understood that any corrections or additions deemed necessary by the Procedure Committee would be added later:

"Every American child has the right to the following services in its development and protection:

1. Every child is entitled to be understood and all dealing with him should be based upon the fullest understanding of the child.

2. Every prospective mother should have suitable information, medical supervision during the prenatal period, competent care at confinement. Every mother should have postnatal medical supervision for herself and child.

3. Every child should receive periodical health examinations before and during the school period, including adolescence, by the family physician, or the school or other public physician, and such examination by specialists and such hospital care as its special needs may require.

4. Every child should have regular dental examination and care.

5. Every child should have instruction in the schools in health and in safety from accidents, and every teacher should be trained in health programs.

6. Every child should be protected from communicable diseases to which he might be exposed at home, in school or at play, and protected from impure milk and food.

7. Every child should have proper sleeping rooms, diet, hours of sleep and play, and parents should receive expert information as to the needs of children of various ages as to these questions.

8. Every child should attend a school which has proper seating, lighting, ventilation, and sanitation. For younger children, kindergartens and nursery schools should be provided to supplement home care.

9. The school should be so organized as to discover and develop the special abilities of each child, and should assist in vocational guidance, for children, like men, succeed by the use of their strongest qualities and special interests.

10. Every child should have some form of religious, moral and character training.

11. Every child has a right to a place to play with adequate facilities therefor.

12. With the expanding domain of the community's responsibilities for children, there

should be proper provision for and supervision of recreation and entertainment.

13. Every child should be protected against labor that stunts growth either physical or mental, that limits education, that deprives children of the right of comradeship, of joy and play.

14. Every child who is blind, deaf, crippled, or otherwise handicapped, should be given expert study and corrective treatment where there is the possibility of relief, and appropriate development or training. Children with subnormal or abnormal mental conditions should receive adequate study, protection, training and care.

15. Every waif and orphan in need must be supported.

16. Every child is entitled to the feeling that he has a home. The extension of the services in the community should supplement and not supplant parents.

17. Children who habitually fail to meet normal standards of human behavior should be provided special care under the guidance of the school, the community health or welfare center or other agency for continued supervision or, if necessary, control.

18. Where the child does not have these services, due to inadequate income of the family, then such services must be provided to him by the community. Obviously, the primary necessity in protection and development of children where poverty is an element in the problem is an adequate standard of living and security for the family within such groups.

19. The rural child should have as satisfactory schooling, health protection and welfare facilities as the city child.

20. In order that these minimum protections of the health and welfare of children may be everywhere available, there should be a district, county or community organization for health education and welfare, with full-

time officials, coördinating with a state-wide program which will be responsive to a nation-wide service of general information, statistics and scientific research. This should include:

- (a) Trained, full-time public health officials with public health nurses, sanitary inspectors and laboratory workers
- (b) Available hospital beds
- (c) Full-time public welfare services for the relief and aid of children in special need from poverty or misfortune, for the protection of children from abuse, neglect, exploitation or moral hazard.
- (d) The development of voluntary organizations for children for purposes of instruction, health and recreation through private effort and benefaction. When possible, existing agencies should be coördinated.

"It is the purpose of this conference to establish the standards by which the efficiency of such services may be tested in the community and to develop the creation of such services. These standards are defined in many particulars in the reports of the committees of the conference. The conference recommends that the continuing committee to be appointed by the President from the conference shall study points upon which agreement has not been reached, shall develop further standards, shall encourage the establishment of services for children, and report to the members of the conference through the President."—*Official Report of the White House Conference on Child Health and Protection*, Supplement to the *United States Daily*, V, 228, Nov. 28, 1930.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

Public Health Nursing in Syracuse, N. Y.—Public health nurses have been employed in the Syracuse Health Department since 1909. In 1926 all these nurses were transferred to a newly organized bureau of nursing and a generalized educational program was adopted. The city is divided into 31 districts and a nurse assigned to each carries on a generalized program, except for public school nursing and bedside nursing. Her services cover prenatal care, infant and preschool hygiene, communicable diseases, tuberculosis, and parochial school hygiene; nutrition and mental hygiene function in each of these services also.

The Child Hygiene Committee of the Community Chest pays the salaries of the prenatal supervisor and 2 delivery nurses in the Nursing Bureau. These nurses aid in the prenatal clinics, make home visits, and assist in the home deliveries, attended by senior students in the Medical College of Syracuse University. The prenatal supervisor is responsible for the technic and clinical standards of the health department nurses, and instructs new nurses in the maternity service.

The Syracuse Department of Public Instruction employs 23 nurses to serve the city's 41 grammar schools, and 1 nurse to render a limited service to the high schools. These nurses assist the school physician, give first aid, assist in control of communicable diseases, make home visits to pupils, and inspect the

school plants. The nurses' home visits are an essential part of the whole school health program.

The Visiting Nurse Association of Syracuse, another Community Chest agency, does bedside nursing care in the homes to maternity cases, to those ill with communicable and non-communicable diseases, and to acute and chronic cases. The nurses in this organization also teach personal hygiene, sanitation, and the prevention of disease. The organization has an hourly nursing service and a 24-hour emergency maternity service.—Public Health Nursing in Syracuse, *Better Health*, Dept. of Health, Syracuse, N. Y., V, 10: 2 (Oct.), 1930.

Tuberculosis Nursing Yardsticks—In a series of Tuberculosis Institutes held in Indiana in October under the auspices of the Indiana State Tuberculosis Association and the Public Health Nursing Division of the State Board of Health, Violet H. Hodgson, R.N., Assistant Director of the National Organization for Public Health Nursing, gave the public health nurses 9 qualitative yardsticks by which they might measure the efficiency of their tuberculosis work:

1. Are you finding new cases in the early stages?
2. Are you succeeding in getting physical defects corrected?
3. How long does the tuberculous patient remain in the sanatorium?
4. How much does personal and home hygiene improve when the patient remains at home? (The record is the yardstick.)
5. Does the home management improve?
6. Does the ability of members of the family to cooperate improve?

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

7. Is the post-sanatorium case rehabilitated in the home?
8. Is your teaching ability improving?
9. How long does the family carry out the mode of living you have taught them?

Public Health Nurses and the Committee on the Costs of Medical Care—Medical societies, health officers, and 320 public health nurses of 15 states and 3 cities outside of these states have been collaborating with The Committee on the Costs of Medical Care in a survey to gather "information regarding the incidence of illness, the expenditures that are made for its prevention and care, the individuals or agencies providing the care, and the distribution of expenditures among families of various income levels."

Families living in cities, towns and rural areas are the types studied. The nurses make house-to-house canvasses of certain families to explain the objectives of the study and get them interested enough to undertake systematic recording of all illnesses and expenditures. To the family who is interested in the study the nurse returns every 2 months to get histories of all illnesses that have occurred since her last visit. During the 12-months period of observation there are 6 interviews (usually representing at least 10 calls) with each family. This calls for a great deal of patience and perseverance on the part of the nurses.

The schedule used in the study is designed to show in detail the history of each illness in a family during a period of 12 months, the type and amount of medical care received, and all financial obligations incurred during that time for medical care. For the purposes of this study, an illness is defined as any disorder which wholly or partially disables an individual for one or more days or for which medical service of any kind is received. Any symptom or disorder for which drugs costing \$.50 or more are purchased is considered an illness.

Nursing, dental and eye care, treatments by osteopaths, chiropractors, and Christian Sci-

ence practitioners, professionally or self-prescribed medication, laboratory work, health examinations and immunizations, and other items are included. Free work by practitioners, hospitals, and clinics, illnesses for which no practitioners are called, and minor ailments are recorded as consistently as costly major operations.

When completed the study will include about 15,000 families.—The Costs of Medical Care: Preliminary Report by Nathan Sinai and Margaret C. Clem, *Miscellaneous Contributions on the Costs of Medical Care*, 2: 3-4 (Nov. 1), 1930.

A Health Officer Describes the Right Kind of Public Health Nurse—Some Don'ts For Her—

1. She may not diagnose or prescribe (not even a cathartic), for only the physician is trained to do these.
2. She may not advise a patient as to who is the best physician to consult about a particular malady, as this function can better be undertaken by the local medical society or the hospitals.
3. She may not choose for the patient among reputable hospitals, for this would tend to make her the source of endorsement for individual hospitals.

Some wonder how the public health nurse can be so important in the control of communicable disease when she cannot diagnose:

There is really no mystery about it. Her training enables her to distinguish the sick from the well; suspicious cases are referred to a physician for diagnosis. Her duty is done when she sounds the alarm upon suspicion. She administers the regulations laid down for her guidance by the state health department or the legislature. All this is done under the direction of the city or county health officer, or in the case of the county nurse working alone, under the direct supervision of the state board of health.

What She Is—

1. The backbone of any public health program worthy of the name
2. Interpreter of the physician to the layman
3. Liaison between headquarters and the

fighting line of control of contagious disease

4. The eyes and ears, hands and feet of the health officer

5. Purveyor to the people of the results of research

6. Health guardian of the school child, the runabout and the infant

7. The messenger of hope to the tuberculous

8. The personification of the statesman's

first responsibility, the care of the public health

9. Her whole reason for being is that she is an educator. Everything she does, though it may seem like service, is done with the educational motive.—

W. W. Bauer, "Knocking At Your Door," *Hygeia*, Dec., 1930, pp. 1145-1147.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Readers Are So Queer—If only words meant the same thing to readers as they do to writers how much simpler our publicity task would be. A surprised and aggrieved writer wonders why his good advice went wrong.

Something seems to be definitely wrong with the three editorials recently published in the columns of this periodical, on patent medicines. No less than three correspondents have written this Bureau for advice as to *what patent medicine to buy*, under the circumstances of their illness. In each case the writer stated that he had tried certain nostrums without result. Attention was called to this mistaken conception of patent medicines, by a previous note in this column, in the October number. It must be repeated that money spent on any patent medicine is wasted. See your family physician and take his advice. He is a trained man—the patent medicine manufacturer has only one interest in life—his own pocketbook.—*Jamaica Public Health Bulletin*, Kingston, Nov., 1930.

What Kind of Meetings—And where do meetings fit into the plans for any public health project, little or big? To help think this out the classification given below is being tested in the Course in Publicity, New York School of Social Work:

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

1. Administrative: Staff—board—committees—membership—annual—clubs and classes; Special jobs and emergencies (legislative—epidemic—unemployment—and so on); Inter-agency.

2. Public emergencies: Legislation—epidemic—unemployment—financial campaigns.

3. Educational: Health education—discussion groups about case work—lecture courses on social problems.

4. Ready-made audiences: Clubs, societies, churches, radio, etc., which can be utilized—see Directory of Organizations in A B C of Exhibit Planning (pages 208-209).

(May be used for public emergencies—education—financial campaigns.)

(May be utilized partly through direct representation—and partly through the sending of announcements, letters, speakers' notes, program plans, plays, etc.)

(May include brief announcements or statements, discussion periods, dramatic or stunt features, single talks, lectures, groups of papers or addresses, demonstrations of work, etc.)

5. Professional: Conferences of health and social workers—national—state—local—inter-city. Discussion groups. Institutes.

A Blueprint for Constructing the Annual Report—A model narrative report for the consideration of nurses and nursing committees to serve as a guide for each nurse when she comes to appraise her work for the month is outlined in *The Red Cross Courier*, Washington, D. C., Nov. 15, 1930.

The editor says:

This rather full outline is meant to be helpful. The new Contract Bridge player keeps his "Work," "Elsworth" or "Whitehead" on his knees for constant reference as he makes each play and bid until his bidding and playing become automatically efficient. Why not use this outline in the same way? Surely there is as much incentive to a public health nurse to write a live, valuable narrative statement of her service as there is incentive to a card player to play a corking, clever game of Contract Bridge.

Here are two sample paragraphs from the outline:

The Daily Work—Human interest stories, short, crisp, alive, uncovered either in work with a single patient, a family or in some group activity; i.e., Home Hygiene class or mothers' club.

Publicity—The fact that the publicity program for the year is being planned and completed; chief objective of the plan, general scheme: editorial in a newspaper; special news item; talk before a ladies' aid meeting; subject; how received, how many present. Report on a window exhibit, subject and purpose, occasion for, success, etc. Roll Call publicity work; work in behalf of Red Cross; response of the public to these various stimuli.

Board Members at Conventions—

Board members are getting their innings at state nursing meetings—and nursing service will be the better for it. At state meetings of nursing groups in Iowa, Pennsylvania, Connecticut, and New York, sessions of great interest were held for board and committee members, as reported in *Public Health Nurse*, 370 7th Ave., New York, N. Y., Dec., 1930. 35 cents.

In Iowa a county superintendent of schools urged "the necessity of publicity in public health procedures."

In Connecticut each one at a luncheon sought to gather information "by sitting next to some one she had never seen before." Also "the advantages of making charts of conditions in associations were brought forward." Here too "a careful review of the *Board Members' Manual* was given by the Education Committee."

One New York session was a luncheon for members of hospital boards, visiting

nurse association boards, nursing school committees, and Red Cross committees. One New York session discussed "Professional Reading," and "how the work of reading and reporting on health reports, magazine articles, etc., might be allotted to board members and brought to board meetings."

In Pennsylvania one speaker outlined how to use the *Board Members' Manual* and another told "how to make a board meeting interesting."

Would not most national and state health meetings get out more board and committee members through the added attraction of well planned sessions taking up health activities from the standpoint of the volunteer worker?

Some Comments on Teaching Through Exhibits—This department has asked some of the members of the American Public Health Association who attended the International Hygiene Exhibition in Dresden last summer for their opinions on the adaptability of the educational methods observed there to our use in America. One reply which offers food for thought comes from our executive secretary, Homer N. Calver. He says after discussing several European museums and exhibitions:

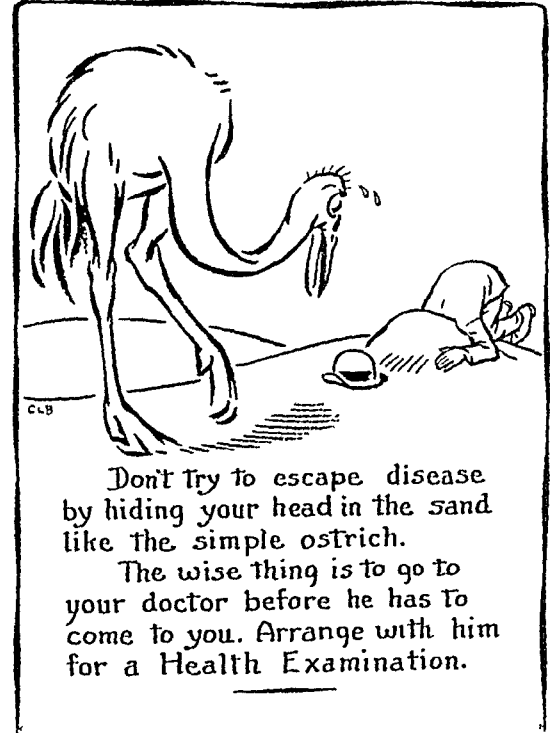
My own thought growing out of these innovations in Europe is that you can do more with a permanent display as established in a museum than with the temporary health exhibit which is so familiar to us here. For teaching purposes, that is, for teaching children, teachers and medical or public health students, there is, it seems to me, the greatest need for a permanent museum. These museums would necessarily have to be different for each of the three groups concerned, different both as to subject matter and method of presentation. In addition there is the problem of popular health instruction through technic of display, but this, of course, should be quite different from any of the other three, although it may approach in some respects the displays for teachers of children. For such displays I am sure that it is necessary to keep in mind three fundamental principles—(1) there should be very little reading matter and what there is should be in large type, illustrated by attractive pictures; (2)

that as far as possible every item should be portrayed in three dimensions; and (3) that a large portion, probably fifty per cent or more, of the displays should be animated. The most important point of all is that animation should be brought about by some act (pushing a lever or turning a crank) of the observer.

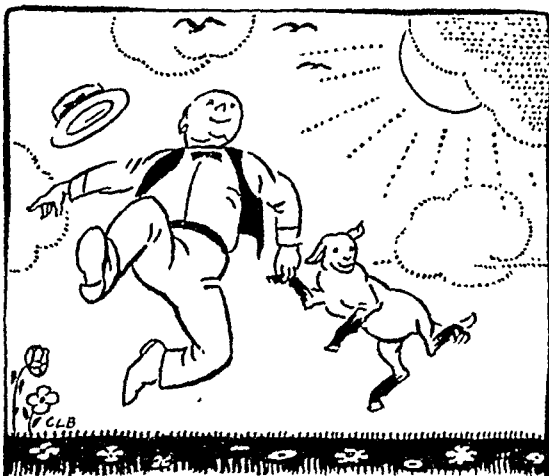
It is far better to limit the scope of the exhibit to a few important ideas which can be shown in accordance with the above expressed principles than it is to cover a wide field with inadequate display.

Health Information with a Front Drive—They are building front-drive automobiles nowadays, because, the engineers assure us, it is easier to pull than to push.

Advertisers are "pulling" business by means of humor. Witness the cartoon of the astonished new father of triplets, who is advised to be nonchalant and to light a certain cigarette. Witness, also, that ragamuffin Skippy, whose "Road to Roam" sells a certain gasoline. And witness, further, John Held's Victorian wood-cuts, which promote a non-croaking cigarette.



The Health Education Division of the New York Tuberculosis and Health Association has tried this method, and found it good. Recently the Association went strictly modern, if humor be a modern invention, and published cartoons. The result is shown here. The drawings are by LeRoy Baldridge, nationally famous artist; the text was hammered out in this office. The results have been most gratifying.—Iago Galdston, M.D., Medical Information Bureau, New York Academy of Medicine.



During the summer play in the open Eat good foods. Sleep eight hours. Build up a reserve of good health.

Store up vitality and energy for the long winter months ahead.

Why Not Use What Has Been Prepared?—Unless one has a sure fire inspiration, why not reprint some of the best educational and publicity material already within reach? Millions of pieces of health educational material as issued by the original producer have

already been distributed by thousands of workers throughout the country. Large quantities have been re-published in the original form. Some items have been adapted to particular state or local needs.

Why not do more of direct re-publication or adaptation of material of unusual merit?

Are there ethical or other reasons for continuing to get out comparatively ineffective material in contrast with the very fine examples already issued from other sources?

This subject seems worthy of the most careful consideration. Will you write the editor? Discuss it in your local health council? Bring it up in publicity or health education sessions of classes in administration in public health training schools? In public health nursing schools? In various public health conventions?

A Well Organized Educational Campaign—"Hamilton County, Tenn., pellagra-free by June, 1931," is the goal which has been set by a committee of Chattanooga and Hamilton County.

Enlisting the help of local clubs, churches, industrial organizations, grocers, dairymen and newspapers, the committee has been able to reach every available group which would be a medium of education. . . . The city supervisor of home economics and the home demonstration agent, who is the supervisor of home economics in the county, were made joint chairmen of publicity and work with community clubs. As a result a definite study of foods which should be eaten to prevent pellagra has been undertaken by the home economics classes of the high schools. The sixth grades have also taken as their problem the study of "Foods That We Should Eat in Hamilton County and Chattanooga to Help Prevent Pellagra." . . .

In one rural community where many of the mothers as well as the men folk work in nearby industrial plants, many cases of pellagra have been found among the school children and their parents as well. In this community the home demonstration agent, at the request of her home economics class,

has helped to start a rat-feeding demonstration to prove the effects of a pellagra producing diet. . . . In other rural sections there are group meeting centers where each week the county Red Cross nutritionist is explaining diet for the cure and prevention of pellagra. The farm and home demonstration agents are stressing winter gardens and encouraging the ownership of cows and the use of their milk. As soon as the rural schools opened in August the teachers began to interest the children in having winter vegetable gardens at home. . . . For his part the county doctor keeps a card file of all cases of pellagra which are reported to him. His department is furnishing yeast to pellagrins who are unable to buy it, and he is trying to make yeast more available by encouraging druggists in the rural sections to carry it. . . .
—*Red Cross Courier*, Washington, D. C., Nov. 15, 1930. *Free*.

DIPHThERIA

"T.A.T. The Magic Medicine." *School Health*, Tuberculosis and Health Society, 51 Warren Ave., West, Detroit, Mich., Nov., 1930.

"Give Your Child A Chance!" Radio talk. New York State Dept. of Health.

"The Three Card Trick," a film issued by Medical Officer of Health. Town Hall, Holborn, London, W.C., England, as described in *Mother and Child*, Nov., 1930:

The first scenes of the film show the haunts of card-sharpers who may play the well-known three-card trick, with the practical impossibility of "Spotting the Lady." Fate often plays a similar trick in the game of life, and the odds against the child when diphtheria enters into the game are particularly heavy. The film then goes on to show the Schick test being applied, and the immunising treatment being given at the Holborn diphtheria immunisation clinic. Finally, three cards are shown—a memorial card to a child lost through diphtheria, then the wedding card she might have had if she had lived, and thirdly, the winning card—a certificate of successful immunisation signed by the Mayor of Holborn.

For the following items address Mrs. Marie F. Kirwan, State Charities Aid

Assn., 105 East 22d St., New York, N. Y.:

For several years Mrs. Kirwan has prepared for distribution at Health Education Headquarters at the A. P. H. A. convention a Chronological Report now brought up-to-date which covers organization activities and publicity material of the Five-Year New York State Diphtheria Prevention Campaign ending Jan. 1, 1931. 2 cents.

A new 24-sheet diphtheria prevention poster, 9½' x 20', depicting an appealing baby with upstretched arms posed against a vivid blue background with the wording "Parents! Toxin-Antitoxin Prevents Diphtheria." \$1.50 each. Free poster space in most communities can be obtained from your local outdoor advertising plant.

A double page leaflet containing reproductions of 22 diphtheria prevention posters, the work of high school students in a State-wide contest held in the high schools of New York State, can be obtained in quantities up to 5,000 for \$1.00 per thousand, plus postage. An extra large printing of these posters makes possible this offer. Better get a sample and see how it could be used in a state or city.

A 4-page brochure "Diphtheria and Its Eradication," by Dr. William H. Park. 2 cents.

RADIO HOURS

Wednesday, 11:15 a.m.—WCCO, Minneapolis and St. Paul. 810-370.2. Minnesota State Medical Assn.

Wednesday, 12:10 p.m.—WRJM, Racine. City Health Dept.

Wednesday, 7:00 p.m.—WGY, Schenectady, N. Y. State Dept. of Health, Albany, N. Y. Changed from 7:40 to 7:00 p.m.

Thursday, 12:40 p.m.—WAIU, Columbus, by Ohio Public Health Assn.

Thursday, 1:25 p.m.—WTIC, Hartford, Conn. Copies free. State Dept. of Health, Hartford.

Friday, 4:50 p.m.—WBZH, Boston, Mass. "Health Forum," by State Dept. of Public Health.

Saturday, 12:00 noon—WGN, Chicago, Ill. State Dept. of Public Health, Springfield, Ill. Mimeographed copies of talks on request.

Some New York State Dept. of

Health broadcasts: Is Open Air, Fresh Air? Off to Camp; Hang your Clothes on a Hickory Limb; Endurance Contests; Our Milk Supply; Save Milk For Our Children; Fresh Air in Industry.

REPORTING

The Ohio Public Health Association, Columbus, has issued a combined Service Report for 1929 and a Program of Service for 1930. In 1929 "General Educational Service" cost \$5,795.64, including Early Diagnosis Campaign, \$1,143.88, and "Child Health Education," \$2,380.26. The 1930 budget included General Education, \$6,332.95, Early Diagnosis, \$1,143.38, and Child Health Organization, \$2,917.57. The "Functions" for 1930 included 10 under "Education," and "... education ... are assumed to be carried on continuously within each" of the 8 major projects of the association.

"Facing A Social Challenge" is a 4-page report of Shoemaker Health and Welfare Center, 1041 Cutter St., Cincinnati. Of special interest to those doing work among Negroes. "Mimeographed copies of the detailed reports obtainable upon request."

It will happen: a state health association issues its annual report with no street address mentioned, and the headquarters city mentioned only once, in small type on the cover.

MAGAZINE ARTICLES

"The Cost of Medical Care," by Dr. O. R. Grogan. *Kiwanis Magazine*, Chicago, Nov., 1930.

"In Current Magazines," in *Semi-Monthly News Letter*, West Virginia State Dept. of Health. Brief mention of articles in professional and general magazines.

"Man's Dirty Clothes." *Literary Digest*. Oct. 11, 1930.

"'Prevention'—to Head Off Dis-

ease." *Literary Digest*. Nov. 8, 1930. Illus. Based on *Journal* article by Dr. H. E. Kleinschmidt.

"Ten Thousand Eyes Saved in Industry." *Literary Digest*, New York. Oct. 11, 1930. Illus. Based on press releases of National Society for the Prevention of Blindness.

HONORABLE MENTION

To Fargo Public Schools: for supplying addresses of publishers of books in reading lists in "Health Education," a course of study.

To American National Red Cross: for annual report with detailed table of contents, with paper and type for easy reading.

To Rockefeller Foundation: for annual report—type, paper, table of contents, and index (even though it overlooks school and popular health education).

To Child Hygiene Division, Indiana State Board of Health: for dating nearly all of a wide range of mimeographed information sheets and method helps issued for child health workers and volunteers.

EDUCATIONAL

Funeral Costs, by J. C. Gebhart. Committee on the Costs of Medical Care, Washington, D. C. 9 pages. *Free*.

Give Your Heart A Chance. Metropolitan Life Ins. Co., New York, N. Y. 10 pages. *Free*.

Infantile Paralysis. Metropolitan Life Ins. Co. 4 pages. *Free*.

Simply worded question-answer copy makes up a new series on syphilis and gonorrhea (5 English, 3 Italian) issued by Bellevue-Yorkville Health Demonstration, 325 East 38th St., New York, N. Y.

"Some Information for Mother," by J. P. Gavit. Illus. Re-issue. 15 cents. American Social Hygiene Assn.

Valentines—two of them—are already being marketed by American Social Hygiene Assn., 370 7th Ave., New York, N. Y. 5 cents each.

What a County Health Department Would Do For Dutchess County, Dutchess Co. Health Assn., Poughkeepsie, N. Y. 2 pages of question-answer text; organization diagram, 1 page.

Buying A Refrigerator, by M. E. Pennington. National Assn. of Ice Industries, 163 West Washington St., Chicago. 8 pages.

LISTS

Directories of state and city health officers appear in *Public Health Reports*, Nov. 14, 1930. Government Printing Office, Washington. 5 cents. The state list includes division and bureau heads, and house organs (the last is not complete).

DATES AHEAD

National Negro Health Week: announced to cover period including birth date of Booker T. Washington, April 5. It is not too early to be starting plans. Consult the 1930 manual in advance of the 1931 manual to be issued by the U. S. Public Health Service. The committee includes Asst. Surg. Gen. R. C. Williams, U. S. Public Health Service, and Dr. Monroe A. Work, Tuskegee Institute, Ala., who will answer questions.

The Gorgas Essay Contest for junior and senior high schools, public and private, will close January 25, 1931. The contests start in the individual local high school, followed by a state contest, and state winners to be entered for national honors and special awards, including \$500 and a travel allowance of \$250 for first place. It is important that any one interested write for details to Gorgas Memorial Institute, 1331 G Street, N.W., Washington, D. C.

BOOKS AND REPORTS

Mouth Infections and their Relation to Systemic Diseases—By *Malcolm Graeme MacNevin, M.D., F.A.C.P., and Harold Stearns Vaughan, M.D., D.D.S., F.A.C.S.* New York: Joseph Purcell Research Memorial, 1930. Price, \$4.00.

To meet the need of physicians and dentists a digest of the literature connecting mouth infections with systemic diseases is here given. The authors say:

In a critical review of the evidence supporting the oral focal infection idea, one is impressed with the limitations of every type of evidence submitted. It leaves one with the feeling that probably everybody contributing to the theory has been mistaken and that perhaps the idea at bottom is unsound. In pursuing the matter to a logical conclusion, one must admit that the proof submitted is not altogether conclusive.

The book is stimulating and will no doubt help in bringing about more accurate and careful investigations, as it cannot but convey dissatisfaction as to present knowledge.

The authors have traced in a very interesting manner the knowledge of mouth pathology and its effects on the body, giving evidences from paleopathology, Egyptian writings, Chinese medical lore, the Talmud, Hippocrates, Pliny, Galen, Walter H. Ryff (1544), who wrote the first dental monograph in the vernacular, to Pierre Fauchard, 18th century founder of modern scientific dentistry, who collected in a single work (1728) the whole doctrine of dental art to his time.

There is a short presentation of the problems of oral sepsis and of the pulpless tooth, followed by discussions of the evidences of oral focal infection, its

mechanism, extension, etc. The principal pathological oral conditions which have been shown to be sources of focal infection are listed. Diseases of the eye, ear, and other organs and systems are taken up in order. The later chapters are devoted to the normal mouth, pyorrhea, and caries.

The historical method is used. Critical comments are interspersed in a conservative manner. Since a second volume is to appear, it is hoped that it will contain both an author and subject index, lacking in the first.

The book shows a large amount of intelligent research. Each chapter is followed by references to the literature on the matters discussed. While the print is good, there is an astonishing number of errors.

The work is a distinct addition to our knowledge of a most important subject, which is too little understood and has been ridden to death on the one hand, but neglected on the other.

M. P. RAVENEL

Legal Anatomy and Surgery—By *Bernard S. Maloy, M.D.* Chicago: Callaghan & Co., 1930. 804 pp. Price, \$15.00.

The human body, Professor J. H. Wigmore tells us in his introduction, is constantly a subject of litigation. Since this is undeniably so, lawyers concerned with the many cases involving injuries and diseases must necessarily know something about the structure and operation of the human system. In this book they will find a lucid, accurate, and thorough description of anatomy, admirably set forth in simple and readable language, illustrated with numer-

ous excellent drawings and photographs.

Although the book is designed primarily for members of the legal profession, it should also be of value to sanitarians, especially those not possessing the medical degree, who desire to look up anatomical facts. It is well printed in large type and has a good index.

In addition to the introduction by Mr. Wigmore, a professor of law, there is another by Dr. W. A. Newman Dorland, who points out that this book is the only one of its kind, and that the author is to be congratulated on having produced a work of such great value. It is a reference book that can be commended to sanitarians whether they are involved in litigation or not.

JAMES A. TOBEY

Molds, Yeasts and Actinomycetes—

By A. T. Henrici, M.D. New York: Wiley, 1930. 296 pp. Price, \$3.50.

This is an excellent textbook for students beginning the study of mycology, as well as a handbook which will be of great assistance to laboratory workers in the fields of medical and industrial application and research.

The selection of the material from the confused and voluminous literature on molds, yeasts and actinomycetes is fortunate. The discussions are presented in an open, stimulating and interesting manner.

The first chapter deals with the structure and classification of the fungi. Since the relationship of the myxomycetes (slime molds) is not understood, and that of the bacteria in some doubt, the term fungi (when not qualified) includes the eumycetes or true fungi, i.e., the yeasts and molds. The actinomycetes seem to represent a transition between the bacteria and the molds and are therefore included in this presentation.

The second chapter considers methods for studying molds, yeasts and actino-

mycetes. Three chapters are devoted to molds; one to *Oidium* and *Monilia*, the fungi transitional between molds and yeasts; two to yeasts, and two to actinomycetes. The classification of the Fungi Imperfecti is discussed, and its difficulties shown.

The important animal and plant diseases caused by fungi are discussed, stress being laid on the distribution and symptoms of the diseases and the methods for isolation and identification of the causative organisms.

An exceptionally good chapter is that on the biological activities of the yeasts. It is presented from the historical standpoint, including the earlier chemical theories of alcoholic fermentation, the Liebig-Pasteur controversy, and a summary of the researches of Brown and Balls, who correlated the disappearance of sugar, the production of alcohol and carbon dioxide with the rate of growth of yeast cells. The nature, preparation and activity of zymase is discussed.

The two chapters on actinomycetes include not only their morphology and classification, but also the diseases in man, animals and plants caused by them.

The book is well printed, the illustrations good and numerous. Each chapter is followed by well selected references. It is a decidedly helpful and useful work, well done.

ESTHER W. STERN

An Introduction to Malariology—

By Mark F. Boyd. Cambridge, Mass.: Harvard University Press, 1930. 437 pp. Price, \$5.00.

Malaria workers all over the world will welcome this book, the title of which aptly gives its scope. The author has done his best work in intensive survey studies, and he leads the reader through successive stages of instruction to this end. A great amount of ascertained fact is presented in text, tables, and charts. He leaves (characteristi-

cally) speculative matter to quoted authorities, and there is no more of this than needed to bridge over what is still *terra incognita*.

The author is far in advance of existing practice, at least in the southern states. Many will differ with him as to the need for such thoroughness on the ground of cost and lack of trained workers, but unless carried out according to the methods outlined, a survey is largely guesswork. Field surveys in malaria correspond exactly to diagnosis in clinical medicine. The more thorough the diagnosis the more satisfactory the treatment. Quoting Darling (through Hackett) that the malariologist "had to learn to think like a mosquito," he follows the psychology of the mosquito through species, environment, climate and topography.

The author takes it for granted that the reader will understand the interchangeable use of the terms "malignant tertian," "*falciparum* infections," "estivo-autumnal malaria," and "subtertian." "Quartan tertian," page 54, obviously should be "quartan." The technic for Hastings's stain is incompletely quoted, leaving one in doubt as to whether the filtrate or the precipitate should be used. It would have been well to have mentioned that "daylite" lamps are unsuited to malaria work. Many will not agree that any of the Romanowsky stains are equally suitable for unfixed thick films. One would like to see more about thick film work, since they are so generally used in the field and so little understood in the laboratory. This applies especially to the description of the very good colored plates, which also might show more examples of parasites. The technic for dissecting mosquitoes is very good. A possible improvement would be to add a slight "stickiness" to the teasing medium.

The printing and make-up are excel-

lent, the illustrations abundant and good. Each chapter is followed by a well selected list of references. Dr. Boyd's work deserves the widest acceptance. He has fully justified the faith of those who know him in its production.

WILLIAM KRAUSS

Edward Jenner and the Discovery of Smallpox Vaccination—By Louis H. Roddis. Menasha, Wis.: George Banta Publishing Co., 1930. Price, \$1.00.

The life story of Edward Jenner is one of the most fascinating in all medical history. Beginning as a country practitioner with apparently no ambition for fame, he discovered, or at least made popular, the prevention of one of the most terrible scourges of the world. He will always be known as one of the greatest benefactors of the human race. Though it took a Pasteur, some 60 years later, to give the rational explanation of Jenner's discovery, this does not in the least detract from the credit due him. Anything concerning the life and work of Jenner is always welcome.

The author of the small volume before us has done a great deal of research, and has given to us in compact form a well and interestingly written story of smallpox prior to Jenner's time, the chief points in the life of Jenner, and the spread of the practice of vaccination. Needless to say, many points of interest which cannot be mentioned in a review are brought into these stories.

There is a good bibliography and a list of Jenner's publications, followed by several appendixes, which furnish handy statistics of the results of vaccination over 100 years, and the deaths in unvaccinated people compared to those vaccinated and revaccinated. The author gives in this material complete refutation of all objections which have been or are being raised against the

practice. The person who can read this book and still question the enormous value of vaccination has some peculiar mental twist, which renders him as insusceptible to reason as though he were dead.

The book is reprinted from the *Military Surgeon*. We owe a debt of gratitude to the author for giving it to us in this handy form. Unfortunately, the printing is not particularly good, there being a number of typographical errors, and the illustrations are not as clear as they might be. On page 147, the death of Sir Edward Jenner is given as 1923, though correctly stated on page 134. We hope for this volume a wide circulation. It can be commended unreservedly.

M. P. RAVENEL

The Healthy-Minded Child—*By Nelson Antrim Crawford, Karl A. Menninger. Coward-McCann, 1930. 198 pp. Price, \$1.75.*

One can hardly say too much in praise of this timely addition to the literature on mental health. It is worthy of rank as a companion volume to that classic of Dr. Thom's, *Everyday Problems of the Everyday Child*, and should be at the elbow of every consultant in child behavior. Whole chapters could be included unreservedly in prescriptions to inquiring parents. Most of the authors have the courage to give specific recommendations for management which are acceptable to the most critical exponents of mental hygiene principles of treatment. One may even say that the book is practically "foolproof." It is good to read again the familiar exposition of the meaning of mental health which cannot be repeated too often. We like the added thought that "it implies the actual betterment of both personality and environment," and again that (page 60) "With all of us our success or failure is fundamentally a matter of balance between our own innate personali-

ties and the difficulties of our environments."

The symposium includes contributions from those experienced in managing problems associated with the home, with the school and with other institutions associated in the promulgation of mental health principles. Specific instructions, ranging all the way from ascertaining motivation to alterations in environment, receive careful consideration.

Means of bringing about compatibility between an individual's desire for the expression of his personality and the requirements of his social setting are suggested by such recommendations as (page 78) "The important thing is to give the child the sense of successful activity," and (page 86) "the emotions generated by obstacles to the gratification of desire may acquire a dangerous force, which can be mitigated either by the gratification of the desire . . . or by the creation of new desires that can be gratified."

Two important fields of activity influencing the mental health of children, play and reading, receive particularly appropriate attention with specifically helpful information and guidance. So-called sex education receives expert handling, the discussion closing with an admonition that could well be carried over into other situations (page 182): "Most important of all, try to get an attitude toward the subject yourself of objectivity. . . . Whatever attitude you have will be unconsciously taken over by the child, regardless of the facts you may tell him orally. He will know how you feel, and he will imitate your emotion."

Perhaps the most impressive thing about the whole volume to the reviewer is the repeated but tactful insistence upon the importance of the parents' own attitudes toward their problems and their difficulties, as an approach to the

management and control of their children's behavior. With the richness of the material presented by most of the authors, the generalities of the chapters on "The Physical Basis of Mental Health" and "Mental Health in Youth" might have been omitted. This is a small, conveniently sized volume, in clear, easily readable type, remarkably light in weight for such a wealth of intellectually solid material.

HELEN P. LANGNER

The Filene Store. A Study of Employees' Relation to Management in a Retail Store—*By Mary Ladame. New York: Russell Sage Foundation, 1930. 541 pp. Price, \$2.50.*

The story of the relationship between management and the employee is to most social minded persons very interesting. Because of its long history and intelligent conduct the personnel program of the Filene Store (a Boston department store) is of especial interest and, more important still, of great value as a guide for other projects of a similar nature.

The present volume presents the results of a study of this personnel program in all of its details. It is very complete and discusses the structure of the association, hours of work and vacations, wages, profits, discipline, welfare work, the arbitration board—its advantages and disadvantages, representation, training of employees and many other important aspects of this problem. The study and report are impartial and highly objective, successes and failures each receiving their share of critical attention by the author. The book constitutes an excellent report of a careful and thorough study which should be of immense value in permanently recording many of the problems which arise in one of the most delicate of social adjustments—that between the employer and employee. LEONARD GREENBURG

Hygiene. A College Textbook for Non-Medical Students—*By R. C. Whitman, M.D. New York: Wiley, 1930. 327 pp. Price, \$2.50.*

A large number of books of the general type of the one before us has appeared during the past few years. The present reviewer groans at the announcement of a new book on hygiene designed for non-medical students. The present volume is distinctly better than the vast majority of the class to which it belongs.

The author states that it is designed to "stimulate reflection and ratiocination, rather than to paralyze the imagination," and describes his work as a "sort of jumble of the problems that the layman meets" in daily life.

In common with other recent books, considerable emphasis has been laid on heredity and eugenics. Twenty-five pages are given to "Endogenous Causes of Disease," and 37 pages to "The Hereditary Diseases of Man." What object has been achieved in listing 372 so-called hereditary diseases, we are not able to see. Under this heading are included anomalies and malformations of the eye, ear, skin, and other parts of the body, among which we find heterochromia, epicanthus, ectopia lentis, distichiasis, megalocornea, embryotoxon, dysostosis cleido-cranialis, etc. This list may not paralyze the imagination, but it certainly will not stimulate ratiocination, and mental indigestion must almost certainly result. We believe that it would have been better to have treated some of the diseases more fully and omitted practically all of this long list of so-called hereditary diseases over which we have no control and for many of which there is no remedy.

We also agree with the opinion of the author's friends given in the preface that there are too many technical and purely medical terms.

The author has succeeded in his aim

of "substantial accuracy," except here and there in his English; e.g., "A man is a man because his fathers were human beings, and a goose is a goose for the same reason."

The book is well printed and fairly well indexed. M. P. RAVENEL

A Compilation of Culture Media for the Cultivation of Micro Organisms—*By Max Levine, Ph.D., and H. W. Schoenlein, M.S. Baltimore: Williams & Wilkins, 1930. 969 pp. Price, \$15.00.*

Written at the request of the Society of American Bacteriologists and under a grant from the Digestive Ferments Company, this book is a compendium of information on culture mediums. It is in the arrangement of the material that the real value lies. About 7,000 formulas are classified into 2,543 quite distinct mediums, each of which is given a number and distinctive name. The descriptions are uniform, each medium being described under the headings: Constituents, Preparation, Sterilization, Use, Variants. The medium classification is based primarily upon physical state. Further classification is made on the basis of additional organic substances and, still further, upon the nature of the nitrogen and carbon sources. Four indexes—Medium Name, Constituents, Author and Use—facilitate the location of any particular formula. A complete list of references from which the formulas were gleaned constitutes an important feature.

To those historically minded, medium 2280a will have peculiar interest. In the *Use* index it appears under "Vibrio cholerae, isolation and cultivation of"; in the *Author* index, under "Koch, R."; in the *Medium Name* index, under "Koch's Nutrient Gelatin." The formula takes up only part of one column and the constituents are merely equal parts of any nutrient medium

(double strength) and gelatin solution 5 to 6 per cent—but Levine and Schoenlein's book would have been much thinner without this contribution of Robert Koch in 1881.

One is a bit startled to find that upon publication the compilation already lacks 4 years of being up to date. This, however, does not detract from its value as much as might at first be assumed, since the more recently published formulas are more available than the earlier ones.

As was inevitable, there are some omissions and minor errors, but as a whole the book is a valuable piece of work, unbelievably well done and a needed addition to the bacteriologist's reference library. We cannot but hope that the use made of this volume will be sufficient to justify the prodigious labor it must have involved.

PEARL KENDRICK

Nursing in Eye, Ear, Nose and Throat Diseases—*By A. Edward Davis and Beaman Douglas. (3d ed. rev.) Philadelphia: Davis, 1930. 373 pp. Price, \$2.50.*

This book has much to commend it for the lucid way in which the anatomy and technical procedures are described. It is short and concise but contains the essentials.

The subject matter is admirably handled as to divisions—anatomy, physiology, preparation of patient, operating room, instruments and after care. Description of disease and diagnostic signs have been touched lightly as is proper in this type of book.

The technic of operations, dressings, instruments and other paraphernalia, as described in this book, are in many instances those of 25 or more years ago, such as cold water coil, powder blowers and use of powders, packing the mastoid wound during dressings, the operation of ossiculectomy and many other things,

all of which were common but have been relegated to the archives. With a careful revision this could well be an admirable text. JOHN W. CARMACK

Adolescence. Studies in Mental Hygiene—By Frankwood E. Williams. New York: Farrar & Rinehart, 1930. 279 pp. Price, \$2.50.

Dr. Williams presents, in this book, a very human picture—human because any statement and any case illustration might well be ourselves or someone we know. This has been accomplished by the compilation of a series of individual papers, each with a comprehensively developed theme, and all having one common denominator unifying the group. That denominator is the consideration by educators (in the broad sense of the term) of the emotional development of the individual.

The goal is emotional maturity—adulthood—represented as a stage where “one is able to see realities in terms of what they are, cleared of all infantile symbolic investments; and where one is able to adjust to an unalterable situation with a minimum of conflict.”

This ideal is not presented as a panacea, but certainly a solution to many problems, since we do know that individuals are distorted, not by “witchery” but through human agencies. Examples of this are abundant in any walk of life—in the court, in the business, and in the home—wherever people in positions of authority make their decisions (as they do) in the light of their own unsolved childhood problems.

As if to justify this clear presentation of so painful a truth, Dr. Williams emphasizes the human quality and universality of “immaturity”—summarized in his last two lines “delinquency is a relative matter—no one is excluded.” He furthermore throws a small but brilliant light into the shadows that have

heretofore enveloped the problems of maladjusted individuals by giving a concise résumé of the accomplishments in the fields of delinquency, mental hygiene in colleges, and child guidance clinics, all of which indeed marks the beginning of the new understanding of human behavior and the new approach for modification as well as prevention.

LILLIAN MALCOVE

Ergebnisse der Sozialen Hygiene und Gesundheitsfürsorge—By Prof. Dr. A. Grotjahn, Prof. Dr. L. Langstein, and Prof. Dr. F. Rott. Leipzig: Verlag Georg Thieme, 1930. Vol. 2, 497 pp., 27 figs. in text. Price, unbound 36 marks, linen 38 marks.

The second volume of this treatise on social hygiene and health conservation is very largely concerned with more or less definite social movements in the interests of health. The 13 chapters, each by a specialist, are all comprehensive and well documented. Among the subjects treated are social environment and heredity with illustrations drawn from “one egg,” i.e., identical, and “two egg,” i.e., not identical twins, with the conclusion that eugenic measures to limit the defective and to conserve the normal are desirable.

The value of periodic medical examination in the conservation of health is presented in an extensive historical review in which American data loom large.

The hygiene of recreation and convalescence in children is treated wholly from German data and largely with reference to tuberculosis. The school feeding of children and dietaries used in hospitals are discussed with reference to organization, diversification, and costs.

The epidemiology and sanitary regulation of poliomyelitis are very effectively presented with graphs of age-incidence, mortality, and comparisons of different localities. German procedure in isolation and disinfection is outlined.

The new German mortality tables are presented and the system of reporting sources of venereal infections recently established in Berlin is explained. It has resulted in large increase in cases detected and brought under medical care in the early stages. The lack of progress in the last half century in the control or elimination of alcoholism is deplored.

CHARLES A. KOFOID

Hieronymus Fracastorius. Contagion, Contagious Diseases, and Their Treatment—By Wilmer Cave Wright, Ph.D. New York: Putnam, 1930. Price, \$4.50.

All lovers of medical history will welcome the appearance of this volume, which is No. II of the "History of Medicine Series" issued under the auspices of the Library of the New York Academy of Medicine. It comes out on the 400th anniversary of the publication of the earliest medical work of Fracastorius, the well-known poem on syphilis—"Syphilis sive Morbus Gallicus."

Fracastorius has a number of claims to greatness. His name will always be one of the great ones in medical history. Two things will be remembered by everyone, either one of which would have insured his fame. As said by Colonel Garrison, his work *De Contagione* "contains the first scientific statement of the true nature of contagion, of infection, of disease germs and the modes of transmission of infectious diseases."

Whatever may have been the origin of the term syphilis—and volumes have been written on the subject—to Fracastorius we owe the poem of that name, which has been described as "divine" even by one of the severest of critics, and also the general adoption of the name for this widespread disease. Practically all critics are eulogistic in writing of this poem. After his death, the Coun-

cil of Verona voted him a marble statue, and stated that in poetry he had surpassed all of his contemporaries. The poem also contains a vast amount of information, though his most notable contribution to our knowledge of syphilis is contained in three chapters of his prose book, *De Contagione*, published 16 years later.

In the volume before us, 44 pages are given to an introduction, which is a clear and scholarly description of Fracastorius himself and his work, together with the opinions of contemporaries and those who came later. The larger part is devoted to his ideas on contagion, 62 pages; the contagious diseases, 102 pages; and their treatment, 160 pages. The left hand pages are in Latin, the right giving the English translation.

The number of subjects treated by Fracastorius is remarkable, and all show great powers of observation and deep knowledge of disease.

Few medical men will be able to criticise the translations, and fewer still have at hand the originals which have been consulted by the translator. However, the book bears every evidence of careful study and masterful knowledge. Forty-two pages are devoted to notes which make clear the amount of study which the translator has given. Finally 6 pages are devoted to a bibliography. The preface states that the present translation of *De Contagione*, published in 1546, is the first which has appeared in English.

It is hard to speak too highly of the character of the work which has been done in the preparation of this volume, and the learning which is evident on every page. The printing and binding are excellent, the whole making up what all must recognise as a valuable addition to any library.

M. P. RAVENEL

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Trenton, N. J.—A new annual report, that of the Trenton Bureau of Health, for the year 1929, is placed on the honor list of the year. An attractive cover bearing the city seal, the title "Trenton, New Jersey's Historic Capital City," a good photograph of the municipal building, an ingenious map showing the relation of the city geographically and according to population to the rest of the United States, and organization charts, prepare the reader for the current report of activities.

This city, with a population of 122,610, and an area of 7.7 square miles, had an appropriation in 1929 of \$112,188 for health work. About one-fourth of the population is foreign-born, the principal foreign groups being Italian, Polish, Hungarian, Russian and English. A birth rate of 22.8 and a resident mortality rate of 11.7 are recorded. There were 44 cases and 4 deaths from diphtheria as compared with 1,505 cases and 105 deaths in 1923. A total of 17,771 children were immunized or shown to be Schick negative during the year. Trends of mortality from various causes are shown by charts accompanying descriptive text.

The planning and assignment of the clerical work of the sanitary division, together with the reception of reports, checking, sending out notices and issuing licenses, is done under the supervision of the registrar of vital statistics, who is also the chief clerk of the department. A chief sanitary inspector supervises the inspection activities. Of 5 sanitary inspectors, one is assigned to communicable disease control and the investigation of complaints. The other 4 inspectors cover certain specified dis-

tricts in the city and make routine inspections of all classes of business involving sanitary and food control measures. There are over 1,500 such places under regular inspection. About 97 per cent of the milk supply is pasteurized, 1 per cent is certified, and the remainder is from tuberculin tested herds.

Infant mortality is analyzed by wards, as well as for the city as a whole. The city rate of 70.8 is contrasted with a rate of 129.9 in 1918. During 1929 there were 408 home nursing visits to prospective mothers, 11,841 visits to first year babies, 8,999 to second year babies, and 11,583 visits to other preschool children. Visits to baby and preschool clinics numbered 12,371. Maternity and boarding homes are also supervised.

Cincinnati, O.—The Cincinnati Social Hygiene Society has rendered a mimeographed report for the year ending May, 1930, which analyzes the field of social hygiene on a community basis and discusses progress. The outstanding achievement is considered the establishment of a course of sex-education for teachers, nurses and leaders at the University of Cincinnati under the auspices of the College of Education and the Social Hygiene Society, with a teacher from the American Social Hygiene Association. There was an enrollment of 60 pupils, and full credit was given toward graduate and undergraduate degrees.

Other educational measures of the Society included special lectures, 148 with attendance of 16,000, study groups, exhibits (once a week during Negro Fair at Church—over 300 pieces

of material distributed) and radio talks. Legal protective measures included co-operation with the Juvenile Court and Police Court with the follow-up work under the Department of Public Welfare. Under medical measures a pamphlet of the U. S. Public Health Service on modern treatment was sent through the Academy of Medicine to physicians, and conferences were held with the clinics. Special attention was given to a Children's Clinic where 1,254 treatments were given.

Haverhill, Mass.—According to the seal on the cover of this annual report of the board of health for 1929, this city was settled in 1640. The health department was organized 50 years ago. Now with a population of 45,467, a resident death rate of 11.9, a birth rate of 17.8 and an infant mortality rate of 42.08 are recorded. The outstanding low rate was for tuberculosis—21.99.

The expenses for the year amounted to \$73,008, or three and four-fifths cents of every dollar raised by taxation for current city expenses. Fifty-six per cent of the money expended was in connection with tuberculosis work including hospitalization. The health department has 535 cases on the register of whom 65 are hospitalized.

New Mexico—New Mexico's 6th report of the Bureau of Public Health for 1929-1930 opens with a table of contents followed by a series of charts showing progress since public health work was organized on a state-wide basis in 1919. The personnel has increased from 4 to 16 and the funds from \$18,000 a year to \$104,000. Public health laboratory specimens have increased from 3,351 to 15,167.

Diphtheria prevailed in many parts of the state in 1919 and was accepted as inevitable. In 1920 there were 1,399 cases. In 1921 toxin-antitoxin was introduced and the number of cases fell

77 per cent within 5 years. There were 372 cases in 1929. During the same period smallpox cases decreased from 316 to 82. Over 40 per cent of the population is now served by full-time county health departments, while public health nurses have increased in 9 years from 4 to 35. This is a noteworthy record of progress. Admission of the State to the U. S. Birth and Death Registration Areas for 1929 marked the culmination of 10 years of effort.

Montclair, N. J.—Among the year's outstanding events are plans developed to strengthen public health nursing work of the official and voluntary agencies by the employment of a coordinating nurse, the employment of a venereal disease control nurse and the continuance of diphtheria prevention work. In 1929 there were 13 cases of diphtheria with no deaths as compared with 40 cases and 3 deaths in 1928.

This city with a population of 40,264 in 1929 (68.5 per cent native white) reports a death rate of 9.4. Nearly all the deaths were of persons 79 years of age or older. An infant mortality rate of 43.5 is creditable and the report refers to the value of the prenatal and postpartum service rendered. Of 574 resident births, 432 occurred in hospitals, and only 21 were attended by midwives. An active well baby clinic service is described.

Colombo, Ceylon—The principal features of the 1929 report of the medical officer of health are several unusually effective spot maps of plague, enteric fever and phthisis, and a detailed analysis of the typhoid fever problem. These spot maps are carefully prepared on a special grade of paper, and the characteristics of the city as well as the location of cases of various kinds by colored dots stand out clearly and add interest to the report. Several excellent charts facilitate an understanding of

special problems, such as the influence on the annual incidence of enteric fever over a long period of years of increased connections of premises with the public sewer.

The chief sources of typhoid infection are shown to be from carriers and from cases diagnosed and notified late in the course of the disease. The most common modes of transmission are by indirect infection through, in the order of importance, (1) fingers, food, mouth; (2) flies, food, mouth; (3) soil, fingers, food, mouth; and less commonly (4) water, mouth, or water, food, mouth.

New Zealand—For the year 1929–1930, the annual report of the Director-General of Health reports a death rate for the Dominion of 8.49, an infant mortality rate of 34.1, a birth rate of 19.0 and a tuberculosis rate of 45.6. The report opens with a discussion of the effects of birth control measures on society and national progress.

It is interesting to note a recom-

mendation for the adoption of national insurance for sickness and invalidity. "It is one method already in operation in England, and throughout Europe and Asia, of partnership with the general medical practitioner for the purpose of disease prevention." Special investigations recorded include a report on a dysentery outbreak in the Auckland district; further results of investigations into problems of stillbirths and neonatal deaths; a survey of physical education in schools; a study in comparative health of Maori and Pakeha children; and a survey of menstrual functions of training-college students and high school girls. It is concluded that there is need for the care and supervision of the young girl through puberty, adolescence to young womanhood. Overtaxing of the bodily strength with study, too great mental strain, too little sleep, lack of practice of the laws of general hygiene, may produce irreparable injury affecting both body and mind.

BOOKS RECEIVED

PUBLIC HEALTH ORGANIZATION IN THE CHICAGO REGION. By Robert F. Steadman. Chicago: University of Chicago, 1930. 279 pp. Price, \$3.00.

NUTRITION AND FOOD CHEMISTRY. By Bernard S. Bronson. New York: Wiley, 1930. 467 pp. Price, \$3.75.

THE PUBLIC'S INVESTMENT IN HOSPITALS. By C. Rufus Rorem. Chicago: University of Chicago Press, 1930. 251 pp. Price, \$2.50.

DENTAL HEALTH. By George A. Swendiman. Boston: Stratford Company, 1930. 121 pp. Price, \$3.00.

THE CONQUEST OF HAPPINESS. By Bertrand Russell. New York: Liveright, 1930. 249 pp. Price, \$3.00.

STRATEGY IN HANDLING PEOPLE. By Ewing T. Webb and John J. B. Morgan. Chicago: Boulton, Pierce & Co., 1930. 260 pp. Price, \$3.00.

TREATMENT OF EPILEPSY. By Fritz B. Talbot. New York: Macmillan, 1930. 308 pp. Price, \$4.00.

TUBERCULOSIS. ITS CAUSE, PREVENTION AND CARE. New York: Macmillan, 1930. 191 pp. Price, \$2.50.

MEDICAL BIOMETRY AND STATISTICS. 2d ed. By Raymond Pearl. Philadelphia: Saunders, 1930. 459 pp. Price, \$5.50.

MOUTH INFECTIONS AND THEIR RELATION TO SYSTEMIC DISEASES. A Review of the Literature by Malcolm Graeme MacNevin and Harold Stearns Vaughan. New York: The Joseph Purcell Research Memorial, 1930. 390 pp.

INDUSTRIAL MICROBIOLOGY. By Henry Field Smyth and Walter Lord Obold. Baltimore: Williams and Wilkins, 1930. 313 pp. Price, \$6.00.

A PRIMER FOR DIABETIC PATIENTS. By Russell M. Wilder. Philadelphia: Saunders, 1930. 138 pp. Price, \$1.50.

THE HISTORY OF PHYSICAL EDUCATION IN COLLEGES FOR WOMEN. By Dorothy S. Ainsworth. New York: Barnes, 1930. 116 pp. Price, \$2.00.

- STUDY GUIDE TEST-BOOK IN HYGIENE.** By Dean Franklin Smiley, Adrian Gordon Gould, and Elizabeth Melby. New York: Macmillan, 1930. 70 pp. Price, \$.80.
- ALLERGIC DISEASES: THEIR DIAGNOSIS AND TREATMENT.** 3d ed. By Ray M. Balyeat. Philadelphia: Davis, 1930. 395 pp. Price, \$5.00.
- COMPEND ON BACTERIOLOGY INCLUDING PATHOGENIC PROTOZOA.** 5th ed. Robert L. Pittfield and Howard W. Schaffer. Philadelphia: Blakiston, 1930. 317 pp. Price, \$2.00.
- THE DEVELOPMENT OF PHYSIOLOGICAL CHEMISTRY IN THE UNITED STATES.** By Russell H. Chittenden. New York: Chemical Catalog Co., 1930. 427 pp. Price, \$6.00.
- SECOND CONFERENCE ON THE HEALTH AND WELFARE OF MERCHANT SEAMEN.** Convoled at Geneva, October 7, 8 and 9, 1929, under the auspices of the Norwegian Red Cross and of the League of Red Cross Societies of the International Union Against Venereal Disease, of the International Union against Tuberculosis, and of the International Mercantile Marine Officers' Association. Paris: Leagues of Red Cross Societies. 346 pp.
- A CHANGING PSYCHOLOGY IN SOCIAL CASE WORK.** By Virginia P. Robinson. Chapel Hill: University of North Carolina Press, 1930. 204 pp. Price, \$2.50.
- BEHAVIOR OF HEALTH.** By Dr. N. A. Ferri. Chicago: Advance Pub. Co., 1930. 236 pp. Price, \$2.50.
- MEMORIES AND VAGARIES.** By Axel Munthe. New York: Dutton, 1930. 257 pp. Price, \$3.00.
- THE BOOK OF MY LIFE.** By Jerome Cardan. Trans. by Jean Stoner. New York: Dutton, 1930. 331 pp. Price, \$3.50.
- MICROBIOLOGY AND ELEMENTARY PATHOLOGY.** By Charles G. Sinclair. Philadelphia: Davis, 1930. 362 pp. Price, \$2.50.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Rural Health Administration—Brief and to the point is this statement of aims and methods of the accepted rural health organization.

BISHOP, E. L. Public Health Organization for Small Communities. *Munic. San.* 1, 11: 610 (Nov.), 1930.

Pneumonia, Type I—The commonest type of pneumonia, especially among young adults, Type I, responds so well to Felton's serum treatment that its general use is advocated.

CECIL, R. L., and PLUMMER, N. Pneumococcus Type I Pneumonia. *J. A. M. A.* 95, 21: 1547 (Nov. 22), 1930.

Immunization with Toxoid—Two injections of 1 c.c. toxoid given 3 weeks apart produced a high percentage of immunity within 4 or 5 months and for practical purposes is an adequate routine in diphtheria prevention.

COOPERSTOCK, M., and WEINFELD, G. F. Rapidity of Immunization with Diphtheria

Toxoid. *Am. J. Dis. Child.* 40, 5: 1035 (Nov.), 1930.

Child Guidance Clinic—The field, scope and problems of the Rochester (N. Y.) clinic are interestingly exemplified by case histories.

CLARKE, E. K. Problems of Child Guidance. *New York State J. Med.* 30, 21: 1271 (Nov. 1), 1930.

Testing for Colon Bacillus—This writer reports the Dominick-Lauter medium superior to the standard procedure for the detection of the colon bacillus in water.

LEAHY, H. W. Comparison of the Dominick-Lauter Presumptive Test with "Standard Methods" Test for *B. Coli* in Water. *J. Am. W. W. Assn.* 22, 11: 1490 (Nov.), 1930.

Smallpox Vaccination—Essentials of vaccination practice, reactions, care of vaccine, methods of vaccination all

briefly outlined in an excellent statement notable for the unqualified assertion that potent vaccine *always* produces some reaction depending upon the degree of immunity of the subject.

LEAKE, J. P., and FORCE, J. N. The Essentials of Smallpox Vaccination. Pub. Health Rep. 45, 46: 2793 (Nov. 14), 1930.

Respiratory Reinfections—Nearly half the children who had a respiratory infection between September 1 and June 1 had one or more recurrent infections. The consistency of this phenomenon suggests a definite periodicity in respiratory infections.

MCLEAN, C. C. The Incidence of Recurrent Infection in Childhood. J. A. M. A. 95, 18: 1338 (Nov. 1), 1930.

Nurses and Tuberculosis—Five rules are listed for the prevention of tuberculosis among nurses to be adopted by hospitals to reduce the high incidence among student and graduate nurses.

MYERS, J. A. The Prevention of Tuberculosis Among Nurses. Am. J. Nurs. 30, 11: 1361 (Nov.), 1930.

Types of Pneumococci—The new classification of pneumococci and other organisms causing pneumonia and a discussion of the types is the subject of this Harben Lecture by a distinguished American.

PARK, W. H. The Types of Pneumococci in Adults and Children and Their Significance. J. State Med. 38, 11: 621 (Nov.), 1930.

Serum Tests for Syphilis—Of the many comparisons between the Kahn and Wassermann tests that have been reported upon from time to time, this seems to be the most exact. In a lim-

ited quantitative series, the Kahn test was found 12 per cent more positive than the Wassermann.

SCHWARTZ, S. C. A Comparison of the Wassermann and Kahn Tests by Means of a Quantitative Method. J. Lab. & Clin. Med. 16, 2: 197 (Nov.), 1930.

Common Cold Etiology—Controlled experiments with the chimpanzee and man show that an uncultivable, filtrable agent found in nasal washings of persons with colds will produce the disease when instilled into the healthy nostril. A very convincing demonstration.

SHIBLEY, G. S. Studies of the Etiology of the Common Cold. J. A. M. A. 95, 21: 1553 (Nov. 22), 1930.

Delay in Entering Sanatoriums—A year elapsed from date of first symptoms before half the patients (in group studied) were admitted to tuberculosis sanatoriums for treatment. Other significant findings are recorded.

WILLIAMS, L. R., and HILL, A. M. The Loss to Time Before a Tuberculous Patient is Admitted to a Sanatorium. New Eng. J. Med. 203, 20: 961 (Nov. 13), 1930.

Normal Serum and Poliomyelitis—Serum from adults and city children neutralized poliomyelitis virus to a greater degree than did that of convalescents. Serum from rural children and infants was practically without immunizing power. The findings suggest that immunity to polio develops similarly to immunity to diphtheria and that normal adult serum may prove as effective therapeutically as convalescent serum.

SHAUGHNESSY, H. J. The Neutralization of Poliomyelitis Virus by Human Serum. J. Prev. Med. 4, 6: 463 (Nov.), 1930.

NEWS FROM THE FIELD

BUST OF LOUIS PASTEUR SENT TO UNIVERSITY OF PENNSYLVANIA

A BRONZE portrait bust of Louis Pasteur, through the will of Arthur C. Hugenschmidt, D.D.S., a friend of the famous scientist, who died in Paris last year, has been sent to the University of Pennsylvania. Dr. Hugenschmidt, dentist to Pasteur, was presented with the bust by Madam Pasteur after her husband's death.

JEFFERSON COUNTY HAS NEW BUREAU OF HEALTH EDUCATION

THE Jefferson County Board of Health of Birmingham, Ala., announces the establishment of a new Bureau of Health Education and Publicity, with K. W. Grimley as first Director.

WORLD CONFERENCE ON WORK FOR THE BLIND

PRESIDENT Hoover has invited 52 nations to participate in a World Conference on Work for the Blind in New York City next April. This Conference has been called upon authorization by Congress, and will be held under the auspices of the following organizations: American Foundation for the Blind, American Association of Instructors of the Blind, and the American Association Workers for the Blind.

CONGRESS OF THE ROYAL INSTITUTE OF PUBLIC HEALTH

THE next annual Congress of The Royal Institute of Public Health will be held in the City of Frankfurt-on-Main from Tuesday, May 19 to Sunday, May 24, 1931, on the invitation of the German Government, the Municipality and the University of Frankfurt.

To this International Congress delegates are being invited from the Governments, the Municipalities, the Universities, and other Public Bodies of Great Britain and Ireland and the British Dominions, as well as from Continental and Foreign Countries.

DR. LANDSTEINER WINS NOBEL PRIZE

DR. Karl Landsteiner, bacteriologist and pathologist on the staff of the Rockefeller Institute for Medical Research, New York, who was awarded the Nobel Prize for Medicine, was born in Vienna, graduated at the University of Vienna in 1891, and was pathologist there from 1909 to 1919. He has been a member of the Rockefeller Institute for Medical Research since 1922. The prize amounts to about \$48,000. The award was based on Dr. Landsteiner's research in connection with blood groups. He is known also for his research on infantile paralysis, paroxysmal hemoglobinuria, and blood serum in relation to immunity. The only other American to have received the Nobel Prize for Medicine was Dr. Alexis Carrel, to whom it was awarded in 1912.

CONFERENCE DISCUSSES HEALTH OF NEGROES

A CONFERENCE of health and welfare workers was held in Washington, October 29 to consider ways of controlling the high mortality of colored people. An executive committee was named to consider a year-round health movement, with George W. Bowles, M.D., as chairman. Plans were made for the next National Negro Health Week, which includes the birth date of Booker Washington, April 5.

NATIONAL COMMITTEE FOR MENTAL
HYGIENE PLANS

THE development of a nation-wide program of research in coöperation with American universities as a next step in the extension of the activities of The National Committee for Mental Hygiene was announced as a major objective for the near future at a luncheon held November 13, 1930, in New York City, in celebration of the Committee's twenty-first anniversary. The effort will be made under the leadership of Dr. C. M. Hincks, who was introduced as the new General Director of the organization, succeeding Dr. Frankwood E. Williams, who will retire on January 1 after 14 years of service.

GRANTS TO TWO FACULTY MEMBERS OF
UNIVERSITY OF SOUTHERN CALIFORNIA

GRANTS have been made to two faculty members of the School of Medicine of the University of Southern California, Dr. Harry J. Deuel and Dr. Clinton H. Thienes, by the National Research Council and the Committee on Scientific Research of the American Medical Association, for the purpose of research in the determination of the antiketogenic value of different carbohydrates.

Dr. Thienes also received a grant of \$500 from the American Medical Association for research in "The Relationship Between Myenteric Plexus and Ganglia and the Mesenteric Nerves."

YELLOW FEVER SACRIFICE MAY NET
DOUBLE PENSION

PRIVATE William H. Dean of the cavalry died after submitting to yellow fever tests in behalf of science. Now Representative Mapes of Michigan has put in a bill to give both his father and mother a pension of \$62.50 a month, and to have Dean's name inscribed on the War Department's roll of honor.

DR. RAVENEL NAMED TO STATE BOARD

DR. R. Mazzyck P. Ravenel, professor of medicine, bacteriology and preventive medicine in the University of Missouri, Columbia, Mo., has been appointed consultant in public health and medical education by the Missouri State Board of Health at a meeting in Jefferson City, December 2.

INTERNATIONAL HOSPITAL CONGRESS

THE International Hospital Congress to be held in Vienna, June 8-14, will bring together men and women interested in hospital work for an interchange of ideas, comparison of practices and proceedings, methods of administration and hospital building costs and economy.

Technical papers will be presented by outstanding authorities on hospital work from throughout the world.

Tours are being offered under the management of the American Express Company. These tours are designed to include visitations to hospitals and hospital laboratories in various cities of Europe en route.

Details may be obtained from Dr. E. H. Lewinski Corwin, Secy. Gen'l, International Hospital Committee, 2 East 103d St., New York, N. Y.

NEW

The staff of the Steiner Cancer Clinic at Atlanta, Ga., has begun the publication of a monthly bulletin devoted largely to cancer case histories.

PERSONALS

DR. ALAN GREGG has been appointed Director for the medical sciences of the Rockefeller Foundation. He will occupy the position vacated by the death, February 16, of Dr. Richard M. Pearce, Jr.

DR. W. ROSS CAMERON, Director of the Berkeley (W. Va.) County Health Unit has resigned to become director of the Washington County (Md.)

Health Department. He is succeeded by Dr. Edwin Cameron from Kentucky.

RUBY H. MANTER of Duluth, Minn., has been appointed to the position of Assistant Bacteriologist in the Maryland State Department of Health.

DR. KATHARINE B. DAVIS is planning to retire to Asilomar, Calif., where she will live with her two sisters. For thirteen years she was superintendent of the New York State Reformatory for Women, establishing the first scientific studies of the physical, mental, social and moral conditions of each inmate. She was the first and only woman to be Commissioner of Correction in New York City. She was chairman of the Parole Board. During the war she worked with the Commission on Training Camp Ac-

tivities. And for the last ten years she has been general secretary of the Bureau of Social Hygiene. Dr. Davis is author of "Factors in the Sex Life of Twenty-Two Hundred Women."

CONFERENCES

Jan. 23-24, American Social Hygiene Association, New York, N. Y.

Mar. 23-27, College of Physicians, Baltimore, Md.

Apr. 2-4, Association of Anatomists, Chicago, Ill.

Apr. 14-20, World Conference on Work for the Blind, New York, N. Y.

Apr. 13-16, American Red Cross, National Convention, Washington, D. C.

June 1-5, Psychiatric Association, Toronto, Can.



More often than not a life preserver has the shape of a fishing rod, a golf club, or a saddle.

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AMERICAN PUBLIC HEALTH ASSOCIATION

370 Seventh Avenue

New York, N. Y.

American Journal of Public Health

and THE NATION'S HEALTH Vol. XIII No. 2

Volume XXI

February, 1931

Number 2

Water-Borne Typhoid Fever Still a Menace*

ABEL WOLMAN, F. A. P. H. A., AND ARTHUR E.
GORMAN, F. A. P. H. A.

*Chief Engineer, Maryland State Department of Health, Baltimore, Md.; and
Wallace & Tiernan Co., Inc., Newark, N. J.*

THE phenomenal decline in the typhoid fever death rate in North America and Europe since the beginning of the 20th century is well known to every health and water works official. Its general trend in the United States is indicated in the 5-year rate table for the U. S. Registration Area:

Year	Deaths per 100,000
1900	35.8
1905	27.9
1910	23.5
1915	12.8
1920	7.9
1925	8.0
1928	4.9

The knowledge of this statistical decrease has unfortunately developed in many places among health and water works officials, and even the general public, an element of tolerance toward this disease and a laxity in control measures which constitute a potential public health hazard. It may be true that as control and preventive measures become better perfected, the cost of carrying them on may be decreased and money may economically be diverted to other public health work. But laxity in control, especially of milk and water, is likely to be reflected in sudden and intense outbreaks of large proportions.

For example, in spite of the rapidly declining typhoid fever death

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

rate on this continent and in Europe, 3 of the largest epidemics on record occurred in the last decade:

TABLE I

Place	Population	Date	Typhoid Fever		Infection
			Cases	Deaths	
Hanover, Germany	427,280	Sept.-Dec., 1926	2,423	545	Water Borne
Lyons, France	600,000*	Jan.-Feb., 1929	2,143*	45*	" "
Montreal, Canada	600,000	March-July, 1927	5,014	488	Milk "

* Incomplete record.

The question might well be asked—If typhoid fever is likely to become almost extinct in the present and coming generations in large centers of population, will a lessened immunity result? If so, in the future outbreaks of this disease, are we likely to have a mortality rate much higher than ever before? If such is the probability and explosive outbreaks of the nature of the 3 cited can occur at this late date, when the arts of water purification and dairy sanitation have reached such a high degree of development, something must be wrong with the control measures.

TABLE II

United States

Year	Outbreaks	Typhoid Fever		Dysentery	Total Persons Affected—Typhoid and Dysentery
		Cases	Deaths	Cases	Cases
1920	26	2,003	133	8,112	10,115
1921	29	550	30	2,899	3,449
1922	20	563	60	800	1,363
1923	24	1,168	119	320	1,488
1924	23	1,039	70	10,611	11,650
1925	24	1,359	16	4,714	6,073
1926	21	849	42	45,143	45,992
1927	30	486	51	1,208	1,694
1928	19	502	33	2,883	3,385
1929	26	848	76	7,655	8,503
<i>Total</i>	<i>242</i>	<i>9,367</i>	<i>630</i>	<i>84,345</i>	<i>93,712</i>

Canada

Year	Outbreaks	Cases	Deaths	Cases
1920	4	327	2	327
1921	4	149	11	149
1922	4	111	0	111
1923	10	1,366	95	1,366
1924	5	170	14	170
1925	1	32	4	32
1926	0	0	0	0
1927	4	311	6	311
1928	2	79	0	79
1929	6	291	13	291
<i>Total</i>	<i>40</i>	<i>2,836</i>	<i>145</i>	<i>2,836</i>

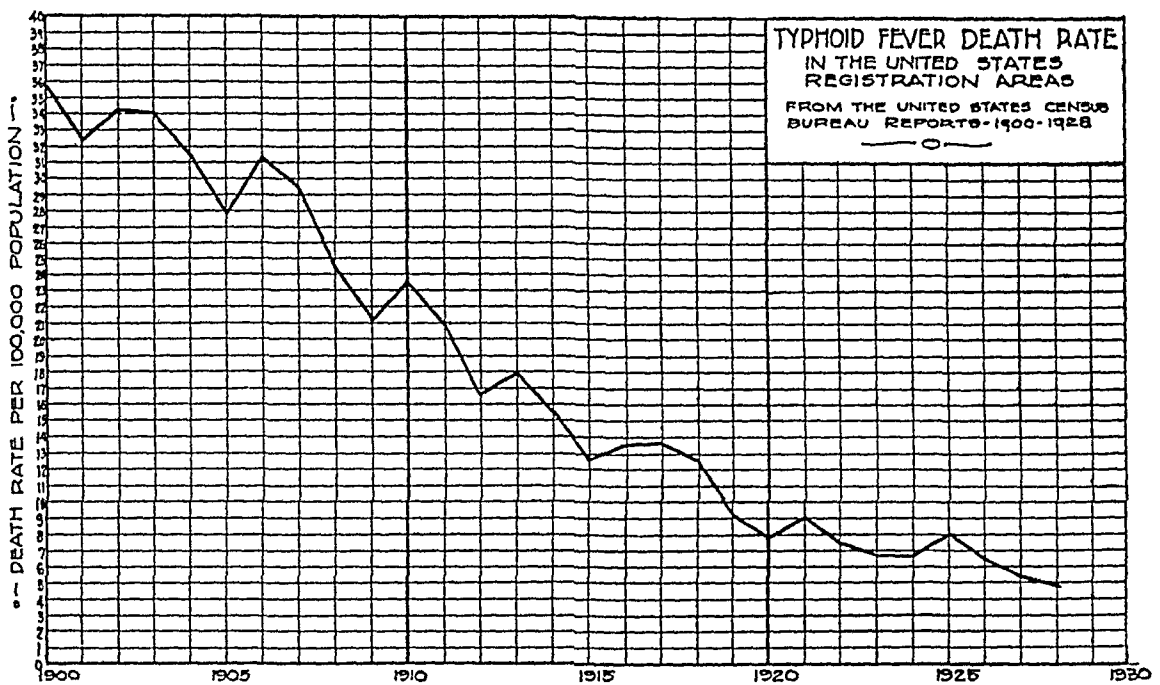


FIGURE I

The control is primarily a responsibility of the health officer, for in a large percentage of cases he has the police power which the courts will sustain. He can insist on the elimination of potentially dangerous conditions and the exercise of the necessary precautionary control measures to provide against emergencies, which might be anticipated, provided reasonable inspection is maintained and recognized standards of performance are enforced.

In order to obtain facts concerning water-borne outbreaks in Canada and the United States and their relationship to the factors over which public health and water works officials have jurisdiction and control, we have made a careful study of the outbreaks which have occurred during the last decade in these countries.

Figure I shows the marked decline in the typhoid fever death rate in the U. S. Registration Area for this decade, which opened with a rate of 35.8 and showed a steady decline to 4.9 per 100,000 in 1928, with the exception of the year 1925. For this year nearly one-third of the states reported increases in their typhoid death rates.

The decade 1920-1929 was selected as representing an era in which knowledge was available for adequate purification of water supplies and for proper protection of these supplies against those hazards reasonably and practicably susceptible to control. The information was obtained from the various state and provincial health departments whose courteous and complete coöperation is herewith acknowledged. These reports were studied, particularly with ref-

erence to identifying the causes of outbreaks and determining therefrom where control measures had failed or were most needed.

Reports were received from 47 states in the United States and 6 provinces in Canada. The United States reports represent 98.65 per cent and the Canadian 79.5 per cent, respectively, of the population of these countries. The only state not reporting was South Carolina. The investigation brought forth the facts summarized in Table II.

The number of outbreaks in the United States shows a distinct increase for the year 1927, rising from 21 in 1926 to 31 in 1927 and dropping to 19 in 1928. This was the year of heavy floods, especially in the Mississippi River valley. These high waters affected water supplies in many states. In Canada, 1923 was the high year for water-borne outbreaks, with 1926 the low. In both the United States and Canada there was an increase in the number of outbreaks in 1929 over previous years. The greatest number of deaths from typhoid fever occurred for the United States in 1920 and for Canada in 1923, reflecting the well known water-borne epidemics at Salem, O., and Cochrane, Ont., respectively.

In Table III the distribution of the 282 outbreaks into population groups indicates, as might be expected, that the larger number occurred in the small cities.

TABLE III

OUTBREAKS OF WATER-BORNE DISEASES IN THE UNITED STATES AND CANADA, CLASSIFIED AS TO POPULATION GROUPS AFFECTED—DECADE 1920-1929

<i>United States</i>		
Population	Number of Outbreaks	Per Cent of Outbreaks
1,000 and under	68	28.1
1,000 to 5,000	89	36.8
5,000 to 10,000	30	12.4
10,000 to 25,000	29	12.0
25,000 to 50,000	11	4.6
50,000 to 100,000	6	2.5
100,000 to 500,000	7	2.8
500,000 to 1,000,000	0	0.0
Over 1,000,000	2	0.8
	<hr/> 242	<hr/> 100.0
<i>Canada</i>		
1,000 and under	6	15.0
1,000 to 5,000	25	62.5
5,000 to 10,000	4	10.0
10,000 to 25,000	5	12.5
	<hr/> 40	<hr/> 100.0

Of the outbreaks in the United States 64.9 per cent, and of those in Canada 77.5 per cent, were in cities having a population of under 5,000. In both countries this appears to be the group needing the greatest attention and supervision. In the United States 4 of the 10 largest typhoid outbreaks and 5 of the 10 largest dysentery outbreaks of the decade occurred in cities of this group. In Canada 8 of the largest typhoid outbreaks were in cities of this group. These facts indicate a distinct need for better supervision over water supplies of the small and moderately small towns.

While we are emphasizing the need for better control in the smaller towns we should, however, note that 2 outbreaks occurred in cities having a population of over one million, where it may be presumed adequate finances were available to provide strict supervision over the quality of the public water supply.

For the purpose of this study the causes of these outbreaks were classified into 7 major groups each with minor subdivisions, making a total of 26 causes. Of these 7 major classifications, 6 relate to points in the water works system from the source of supply to the consumer's tap. The 7th includes a miscellaneous group not readily classified elsewhere. The classification is shown in Table IV A.

Table IV summarizes these findings and presents information worthy of careful study by health and water works officials.

The largest number of outbreaks in both the United States and Canada was due to the use of untreated surface water supplies. This was to be expected if one bears in mind the widespread pollution of surface water in these countries. In the United States the second largest number of outbreaks—57—was caused by the use of untreated ground water. In a majority of these—30—the sources were shallow wells polluted from surface sources.

It is worthy of note that, whereas the use of untreated surface and well water was responsible for 52.1 per cent and 55 per cent of the outbreaks in the United States and Canada respectively, the percentage of total typhoid fever cases in Canada due to the use of raw water was almost twice that in the United States—64.1 to 33.3.

One of the most important and significant findings in this study is the fact that in the United States, and to a lesser degree in Canada, water-borne outbreaks during the past decade have been due almost as much to laxity in handling water from its source to the consumer as to the use of water from polluted sources. This is a strong indictment of our methods of supervision and control and deserves very serious consideration by health and water works officials. In the United States, excluding the 14 outbreaks for which the cause is unknown,

TABLE IV

CLASSIFICATION OF WATER-BORNE OUTBREAKS IN THE UNITED STATES AND CANADA 1920-1929
INCLUSIVE, AS TO POINT OF POLLUTION IN WATER WORKS SYSTEM

Classification	<i>United States</i>						Total Cases of	
	Out- breaks	Per Cent	Cases of Typhoid	Per Cent	Cases of Dysentery	Per Cent	Typhoid and Dysentery	Per Cent
Untreated Surface Water Supplies	69	28.5	1,506	16.0	590	0.7	2,156	2.3
Untreated Ground Water Supplies	57	23.6	1,606	17.3	13,936	16.5	15,542	16.6
Contamination of Reservoirs and Cisterns	5	2.1	68	0.7	1,269	1.5	1,337	1.4
Inadequate Control Over Water Purification Methods	49	20.2	1,975	21.1	48,725	57.8	50,700	54.1
Contamination in Distribution System	31	12.8	2,055	21.9	6,535	7.8	8,590	9.2
Contamination in Collection or Conduit System	17	7.0	1,883	20.1	11,810	14.0	13,723	14.7
Miscellaneous	14	5.8	274	2.9	1,450	1.7	1,664	1.7
<i>Totals</i>	242	100.0	9,367	100.0	84,345	100.0	93,712	100.0
<i>Canada</i>								
Untreated Surface Water Supplies	19	47.5	1,818	61.1				
Untreated Ground Water Supplies	3	7.5	45	1.6				
Contamination of Reservoirs and Cisterns	1	2.5	42	1.5				
Inadequate Control Over Water Purification Methods	8	20.0	433	15.3				
Contamination in Distribution System	6	15.0	214	7.5				
Contamination in Collection or Conduit System	3	7.5	284	10.0				
<i>Totals</i>	40	100.0	2,836	100.0				

the records show that 102 of a total of 228 outbreaks, or 44.7 per cent, were due to contamination occurring in the collection, delivery, or storage, or laxity in treatment. For Canada this percentage is 40.5.

The indications are that, in a high percentage of these cases, outbreaks could have been prevented by adequate inspection and control measures. Perhaps the most obvious case reported is that of one of

TABLE IV A

CLASSIFICATION OF CAUSES FOR WATER-BORNE TYPHOID FEVER FOR THE UNITED STATES AND CANADA DURING THE DECADE 1920-1929 INCLUSIVE

A. Surface Water Supplies—

1. Contamination of brook or stream by pollution on watershed
2. Use of polluted river water—untreated
3. Use of polluted lake water—untreated
4. Contamination of spring well or infiltration gallery by pollution on watershed
5. Contamination of spring well or infiltration gallery by flood waters

B. Underground Water Supplies—

1. Surface pollution of shallow wells
2. Faulty well casing or construction
3. Pollution of deep well from adjacent river or lake
4. Pollution of well from adjacent sewer or sewage tank
5. Underground pollution of well or spring in creviced limestone
6. Underground pollution of well or spring, source unknown
7. Underground pollution of well by surface contamination through abandoned well
8. Overflow of sewer or flood water into top of well casing

C. Reservoirs or Cistern Storage—

1. Seepage from sewer or surface into cracked cistern or reservoir

D. Water Purification—

1. Inadequate control of filtration and allied treatment
2. Inadequate chlorination—when only treatment
3. Interruption of chlorination—when only treatment

F. Distribution System—

1. Pollution of water mains during construction or repairs
2. Leaking water and sewer in same trench
3. Cross-connection with polluted water supply
4. Break in supply main in river crossing

G. Collection or Conduit System—

1. Auxiliary intakes to polluted source
2. Seepage of surface water or sewage into gravity conduit

H. Miscellaneous—

1. Use of polluted private supply because of objectionable taste or quality of public supply
2. Use of polluted water not intended for drinking purposes
3. Cause of outbreak undetermined
4. Data insufficient for classification

America's largest cities, Detroit, where in spite of the fact that the city was equipped with one of the most modern rapid sand filtration plants, in February, 1926, it suffered an outbreak of water-borne dysentery amounting to at least 45,000 to 50,000 cases.

A balanced picture of the situation cannot, however, be obtained from a study of the number of outbreaks. Let us analyze the data by persons affected as indicated in the cases of typhoid and dysentery reported. Of the typhoid cases 43.7 per cent, and of the dysentery cases 66.1 per cent, were due primarily not to the use of polluted water at its source, but to laxity in source treatment or distribution methods.

It is, of course, a recognized fact that the use of surface or ground waters subject to pollution and without adequate purification treatment is an invitation to water-borne outbreaks. But when water is

known to be polluted and in consequence of this purification methods have been provided, is it not a serious reflection on both water works and health officials to have outbreaks of typhoid fever and dysentery occur? In the United States 2,055 cases of typhoid fever occurred because of pollution of an apparently safe water as it was being distributed to the consumer. Of these, 1,995, or over 95 per cent, were due to unprotected cross-connections with polluted water supplies. Among these were the disastrous outbreaks at Winona Lake and Fort Wayne, Ind., and Bloomington, Ill.

Inadequate control over purification methods accounted for 1,925 cases. Of these, 395 were cases where treatment consisted of filtration and chlorination—a combination capable of giving protection against heavily polluted water if efficiently operated. Inadequate chlorination, where this treatment was the sole protection, was responsible for 985 cases. This clearly indicates lack of proper control measures. Among these outbreaks were those at Newport and Covington, Ky., Akron, N. Y., Delaware, O., and Salt Lake City, Utah. In the residual chlorine test, plant operators have at their command an effective method of controlling chlorination to give complete public health protection. With proper control measures all of these cases could have been prevented.

Seventeen outbreaks in the United States, representing 594 cases of typhoid fever, were due to interruption in chlorination where this was the only safeguard against contamination. In 6 instances the chlorinator was out of order and in the others it had been shut down. In Pittsburg, Calif., Alpena, Mich., and Greeneville, Tenn., were the outstanding outbreaks of this group. The reliance on one chlorinator where chlorination is the sole line of defense against a potentially dangerous water supply has always been considered a serious error, but the shut-down of chlorination under these circumstances is little short of criminal negligence. These are facts which health and water works officials must face, for the responsibility is theirs.

The number of typhoid fever and dysentery cases resulting from contamination in the system for collection and transmission of raw water was high in both the United States and Canada. Auxiliary intakes were responsible for 4 outbreaks in the United States, representing 2,300 dysentery and 69 typhoid cases. Sewage pollution of gravity conduits or breaks in suction lines caused 13 outbreaks, 9,540 cases of dysentery and 1,814 of typhoid fever. The use of vitrified tile pipe for gravity transmission of water took a heavy toll. This group included the classic Salem, O., epidemic, the Brigham, Utah, typhoid outbreak, and the Greenville, Ill., dysentery outbreak.

TABLE V

RELATIVE MAGNITUDE OF WATER-BORNE OUTBREAKS 1920-1929 INCLUSIVE

United States

Rank	Class	No. of Outbreaks	Rank	Cases of Typhoid Fever	Rank	Cases of Dysentery	Rank	Persons Affected Total Typhoid and Dysentery Cases
1	B 1	30	4	660	6	2,005	5	2,665
2	F 3	29	1	1,995	4	6,535	4	8,530
3	A 2	21	10	340	14	185	14	525
4	A 1	21	6	510	17	0	15	510
5	D 3	17	5	595	15	32	11	626
6	D 1	17	8	396	1	47,311	1	47,707
7	A 4	16	7	454	16	5	16	459
8	D 2	15	3	985	7	1,382	7	2,367
9	G 2	13	2	1,814	3	9,540	2	11,354
10	B 5	10	11	289	9	1,089	8	1,378
11	A 5	7	13	123	12	400	13	523
12	H 3	5	19	60	10	600	10	660
13	H 4	5	20	54	11	500	12	554
14	C 1	5	18	68	8	1,269	9	1,337
15	B 8	5	9	381	2	10,650	3	11,031
16	B 2	4	23	20	13	192	17	212
17	A 3	4	14	79	17	0	20	79
18	G 1	4	17	69	5	2,300	6	2,369
19	B 6	3	12	133	17	0	18	133
20	B 7	3	21	50	17	0	23	50
21	B 4	2	15	73	17	0	21	73
22	H 1	2	14	90	17	0	19	90
23	H 2	2	16	70	13	350	22	70
24	F 1	1	24	13	17	0	25	13
25	F 2	1	22	47	17	0	24	47
26	B 3	0	25	0	17	0	26	0
<i>Total</i>		242		9,367		84,345		93,712

RELATIVE MAGNITUDE OF WATER-BORNE OUTBREAKS—DECADE 1920-1929 INCLUSIVE

Canada

Rank	Class	No. of Outbreaks	Rank	Cases of Typhoid Fever	Rank	Deaths
1	A 2	10	2	590	3	13
2	A 1	6	4	285	4	11
3	D 2	4	7	113	5	9
4	F 3	4	6	166	6	8
5	A 3	3	1	943	1	70
6	B 1	2	14	20	11	1
7	D 1	2	10	32	8	4
8	D 3	2	3	288	2	20
9	G 1	2	5	228	10	2
10	B 5	1	12	25	—	—
11	C 1	1	9	42	—	—
12	F 1	1	11	27	9	2
13	F 4	1	13	21	—	—
14	G 2	1	8	56	7	5
		40		2,835		145

Breaks in suction lines were responsible for 2 outbreaks at Grand Forks, N. D., and the well known Olean, N. Y., epidemic. In Canada, 3 outbreaks were due to the use of auxiliary intakes and 1, the Kingsville typhoid outbreak, was due to a break in the intake pipe.

The contamination of water in storage in reservoirs and cisterns caused 5 outbreaks in the United States and 3 in Canada. In 4 of those in the United States there were 1,269 cases of dysentery. The largest one was at Marseilles, Ill., where leakage from a polluted stream adjacent to a storage reservoir caused 700 cases; a second at Canton, Mo., resulted in 500 cases of dysentery, 42 of typhoid fever, and 3 deaths.

RELATIVE MAGNITUDE OF WATER-BORNE OUTBREAKS AND THEIR CONTRIBUTING CAUSES

To permit study of the relative importance of various contributing causes of water-borne outbreaks by their number and cases of typhoid fever and dysentery resulting, this information has been arranged statistically in Tables V and VI.

While the greatest number of outbreaks in the United States were due to drinking water from shallow wells, unprotected cross-connections and inadequate control over purification methods, however, account for the largest numbers of cases of typhoid fever and dysentery respectively. The public health importance of unprotected cross-connections is further emphasized by the fact that this rated second in causes for total outbreaks and fourth in dysentery cases. From these figures it might well be classed as the outstanding public health danger in water works operations.

Considering the number of persons affected, failures in purification methods lead the list; but in using this figure of 47,707 persons affected, it must be remembered that 45,000 of these were cases of dysentery in one outbreak in Detroit in 1926. Second in importance, as to total number of persons affected, is water in transmission through tile gravity conduits. This is a dangerous practice, and both water works and health officials should insist upon its discontinuance. The unprotected cross-connection hazard comes third in order of persons affected, and the use of water from shallow wells is fourth.

In Canada, polluted surface waters, inadequate control over purification methods, and unprotected cross-connections are the most important factors requiring the attention of health and water works officials.

Of the 47 states from which reports were received, 9 had no water-borne outbreaks. This does not mean that there was no typhoid fever in these states during this decade, but that there were no outbreaks of

TABLE VI

RECAPITULATION OF TEN PRINCIPAL CAUSES OF WATER-BORNE OUTBREAKS—DECADE 1920-1929

United States

Outbreaks		Cases of Typhoid Fever		Cases of Dysentery		Persons Affected	
Cause	Number	Rank	Cause	Number	Rank	Cause	Number
B 1	30	1	F 3	1,995	1	D 1	47,707
F 3	29	2	G 2	1,814	2	B 8	11,354
A 2	21	3	D 2	985	3	G 2	11,031
A 1	19	4	B 1	660	4	F 3	8,530
D 3	17	5	D 3	595	5	B 1	2,665
D 1	17	6	A 1	510	6	G 1	2,369
A 4	16	7	A 4	454	7	D 2	2,367
D 2	15	8	D 1	396	8	B 5	1,378
G 2	13	9	B 8	381	9	C 1	1,337
B 5	10	10	A 4	340	10	H 3	660
<hr/>		<hr/>		<hr/>		<hr/>	
186		8,130		82,681		89,398	

$$\% \text{ Total} = \frac{186}{242} = 76.9 \quad \% \text{ Total} = \frac{8,130}{9,367} = 86.8 \quad \% \text{ Total} = \frac{82,681}{84,345} = 98.0 \quad \% \text{ Total} = \frac{89,398}{93,712} = 95.4$$

Canada

A 2	10	1	A 3	943
A 1	6	2	A 2	590
D 2	4	3	D 3	288
F 3	4	4	A 1	285
A 3	3	5	G 1	228
B 1	2	6	F 3	166
D 1	2	7	D 2	113
D 3	2	8	G 2	56
G 1	2	9	C 1	42
B 5	1	10	D 2	32
<hr/>		<hr/>		
36		2,743		

$$\% \text{ Total} = \frac{36}{40} = 90 \quad \% \text{ Total} = \frac{2,743}{2,836} = 96.8$$

any magnitude in a single locality for the decade. They are: Arkansas, Colorado, Connecticut, Delaware, Florida, Louisiana, Massachusetts, New Hampshire, and Nevada.

Wyoming reports 609 cases and 139 deaths from typhoid fever for the decade. They were not classified as to cause and therefore could not be included in this statistical summary. It is reported that practically all of these were water-borne and occurred in Big Horn County due to drinking water from the Shoshoni River, on the watershed of which an increasing number of tourists have resided during summer months.

THE LARGEST WATER-BORNE OUTBREAKS

In Tables VII and VIII statistics are given of the 25 largest water-borne typhoid fever and dysentery outbreaks of the decade in the

TABLE VII

25 LARGEST REPORTED TYPHOID WATER-BORNE OUTBREAKS IN UNITED STATES DURING THE
DECADE 1920-1929 INCLUSIVE IN ORDER OF MAGNITUDE

Town	State	Month	Year	Population	Cases	Deaths
Winona Lake	Indiana	July	1925		1,000	?
Salem	Ohio	Aug.-Jan.	1920-21	10,305	884	27
Santa Ana	California	Jan.-Feb.	1924	30,000	369	28
Akron	New York	Aug.-Nov.	1926	3,100	284	18
Olean	New York	Sept.-Oct.	1928	21,400	245	15
Brigham City	Utah	July-Sept.	1923	4,200	230	15
Helena	Montana	Sept.	1929	12,000	205	17
Bloomington	Illinois	Jan.	1920	28,725	200	21
Chicago	Illinois	Nov.	1923	2,701,705	150	15
Pittsburg	California	May-June	1920	4,700	144	2
Salt Lake City	Utah	Sept.-Oct.	1924	131,590	144	12
Fort Wayne	Indiana	Nov.-Dec.	1923	90,000	140	24
Grafton	West Virginia	Dec.	1927	10,000	125	20
Alpena	Michigan	Mar.-May	1920	11,101	118	11
Albany	New York	Apr.	1924	117,800	114	14
Franklin Boro	New Jersey	Nov.	1922	4,000	114	18
Covington } Newport }	Kentucky	Feb.	1923	60,000	100	15
Seneca Falls	New York	Mar.-Sept.	1920	7,000	100	6
Mechanicville	New York	Jan.-Oct.	1920	8,900	96	10
"N"	Pennsylvania		1924	644	90	—
Gouverneur	New York	Sept.-Oct.	1921	4,140	85	4
Coalwood-Caretta	West Virginia		1929	400	85	6
Winston	Missouri	May	1929	339	82	3
Herington	Kansas	July-Aug.	1923	4,010	79	7
Assumption	Illinois	July	1927	1,852	78	—
					5,261	311

$$\% \text{ of all Typhoid} = \frac{5,261}{9,287} = 56.6 \quad \% \text{ of all Deaths} = \frac{311}{614} = 50.6$$

10 LARGEST TYPHOID FEVER OUTBREAKS IN CANADA DURING DECADE 1920-1929 INCLUSIVE

Town	Province	Month	Year	Population	Cases	Deaths
Cochrane	Ontario	Spring	1923	3,500	935	70
Pt. Gatineau	Quebec	Aug.	1929	2,000	200	9
St. Leonards	New Brunswick		1927	1,200	200	
Terrebonne	Quebec	Mar.	1920	2,000	160	
St. Jerome	Quebec	Nov.	1923	8,000	115	4
Bathurst	New Brunswick		1920	1,500	115	
Edmondston	New Brunswick		1923	5,000	100	
Lachine	Quebec	Feb.-Mar.	1924	15,000	88	11
Pottam Twp.	Quebec	Apr.	1923	350	87	9
Buckingham	Quebec	Jan.	1928	3,800	65	
					2,065	103

$$\% \text{ of all Typhoid} = \frac{2,065}{2,836} = 73.0 \quad \% \text{ of all Deaths} = \frac{103}{145} = 71.0$$

United States and the 10 largest for Canada. It is interesting to note that 8 of the typhoid outbreaks in the United States and 3 of those in Canada had 200 cases or more each.

Each country had an epidemic of about 1,000 cases. That at Winona Lake, Ind., was due to a cross-connection with the water supply at a religious camp meeting place. The State Board of Health reports that practically all of the victims were out of town visitors, citizens in a large number of states being affected. The 1,000 reported cases probably do not include all which occurred, although the extent of this outbreak was thoroughly investigated.

The Cochrane, Ont., typhoid fever epidemic, with 935 cases and 70 deaths, was one of the most severe water-borne outbreaks in Canada's history. It was caused by sewage entering a lake from which the city water supply was obtained, owing to a change in water level of an adjacent lake into which the city discharged its sewage. Considering that the population of Cochrane was only 3,500, this is one of the most severe outbreaks on record.

The Salem, O., typhoid outbreak, as well as the one at Santa Ana,

TABLE VIII

25 LARGEST REPORTED DYSENTERY OUTBREAKS IN UNITED STATES DURING THE DECADE 1920-1929 INCLUSIVE IN ORDER OF MAGNITUDE

Town	State	Month	Year	Population	Cases
Detroit	Michigan	Feb.	1926	1,300,000	45,000
Santa Ana	California	Jan.-Feb.	1924	30,000	10,000
Salem	Ohio	Aug.-Jan.	1920-21	10,305	7,000
Fort Wayne	Indiana	Mar.	1929	100,000	5,000
Hillsboro	Ohio	Jan.	1921	4,356	2,000
Ozark Beach	Missouri	July	1928-29		2,000
Charlestown	Illinois	Nov.	1925	6,615	2,000
Greenville	Illinois	Jan.	1925	3,091	2,000
Riverside	Illinois	Sept.	1929	2,532	1,000
Bloomington	Illinois	Jan.	1920	28,725	1,000
Marseilles	Illinois	Jan.	1928	3,391	700
Garrett	Indiana	Nov.	1925	5,000	600
Oswego	New York	Dec.-Jan.	1928	22,369	500
Canton	Mississippi	Jan.	1922	3,000	500
"B"	Pennsylvania		1921	17,466	500
Yorkville	Illinois	Oct.	1928	411	400
Delaware	Ohio	Sept.-Dec.	1921	8,756	373
Covington } Newport }	Kentucky	Feb.	1923	60,000	300
Packing Plant					
So. St. Paul	Minnesota	June	1929	2,700	300
"A"	Tennessee	Jan.	1928	1,500	300
Grand Forks	North Dakota	Jan.	1928	14,010	300
Shirley	Indiana	Mar.	1927	1,200	250
No. Judson	Indiana	Sept.	1927	1,200	200
So. Pasadena	California	Apr.	1924	4,000	200
"A"	Pennsylvania		1922	1,943	200
Williamson	West Virginia	July	1924	7,000	111

82,734

$$\% \text{ of all Dysentery} = \frac{82,734}{83,995} = 98.6$$

Calif., were bitter lessons in public health control. The former was caused by sewage entering a break in a gravity conduit; the latter by sewage backing up in a drain from an air lift well allowing pollution to enter the top of the well.

Ten dysentery outbreaks included 1,000 or more cases. It is believed that the reporting of dysentery cases in connection with other typhoid outbreaks is far from complete. No dysentery cases were reported in the Canada statistics.

In both the Salem and Santa Ana outbreaks there was a large number of dysentery cases as well as typhoid fever, 7,000 and 10,000 respectively. The Detroit outbreak leads the dysentery list with 45,000 to 50,000 cases.

REPEAT OUTBREAKS FROM SAME CAUSE

There were 5 repeat outbreaks from the same cause, indicating lack of proper corrective measures. These were:

City	State	Year	Typhoid Fever		Dysentery	Cause
			Cases	Deaths	Cases	
Talledega	Alabama	1921	25+	—	—	Improper chlorination control
"	"	1923	17	—	—	" " "
Fort Wayne	Indiana	1923	140	20	—	Cross-connection
"	"	1929	53	3	500	" "
Herington	Kansas	1922	—	—	Many	Polluted spring
"	"	1923	19	7	?	" "
Grand Forks	N. Dakota	1928	—	—	1,500	Leak in suction line under
"	"	1929	—	—	General	river
Wausau	Wisconsin	1923	7	3	20	Cross-connection
"	"	1924	4	—	60	" "

REPEAT OUTBREAKS IN SAME CITY—DIFFERENT CAUSE

In 4 cities there were more than one outbreak during the decade; in fact at Sturgeon Bay, Wis., including the rural district outside the city, there were 4 distinct ones.

City	State	Year	Typhoid Fever		Dysentery	Cause
			Cases	Deaths	Cases	
Albany	New York	1924	114	14	?	Leaky gravity conduit under
"	"	1928	30	1	8	canal. 2nd—cross-connection
Oswego	"	1927	10	2	—	Cross-connection
"	"	1927	—	—	500	Inadequate chlorination
Sturgeon Bay	Wisconsin	1921	21	1	—	Surface pollution of shallow
"	"	1922	31	3	—	well in creviced limestone
"	"	1924	20	2	—	by sewers and privies
"	"	1929	70	7	—	
Fond du Lac	"	1922	12	—	—	Leakage of sewage into ex-
"	"					haust from air lift well
"	"	1929	50	3	—	Pollution of well supply
						through river draining into
						abandoned well

DAMAGE SUITS RESULTING FROM WATER-BORNE OUTBREAKS

During the decade 1920–1929 considerable history was made in the courts both in the United States and Canada as to the responsibility of cities, private water companies and industries in regard to illness resulting from pollution of public water supplies. The trend of the courts is distinctly toward awarding substantial damages against those cities and companies subjecting the public to health hazards through carelessness. Among the more important suits were those at:

United States
Olean, New York
Albany, New York
Ogden, Utah
Everett, Washington
Fort Wayne, Indiana
City "A," Texas

Canada
Owen Sound, Ontario
Jordan, Ontario
Kingsville, Ontario

CONCLUSIONS

1. While the typhoid fever death rate in the United States and Canada has made a phenomenal drop since 1900, many large water-borne typhoid outbreaks have occurred during the last decade.

2. Special attention is needed for better control over the safety of water supplies in small cities, as 64.9 per cent of the outbreaks in the United States and 77.5 per cent of those in Canada occurred in those of 5,000 population and under.

3. A study of the causes of 282 outbreaks shows clearly the need for more attention on the part of water works and health officials to supervision and control over treatment processes, especially over disinfection where pollutorial loads on treatment plants are high or where chlorination is the only safeguard.

4. Over three-quarters of the water-borne illness reported in the United States during the decade 1920–1929, representing 40 per cent of the outbreaks, was due primarily not to pollution of the raw water at its source, but to defects in the system for collecting, treating, storing or distributing of the water for public consumption.

5. Unprotected cross-connections between polluted fire supplies and public water systems were the most important single cause contributing to water-borne outbreaks during the decade 1920–1929 and demand the most active attention of health and water works officials.

6. During the decade there were 5 repeat water-borne outbreaks in 1 city from the same cause, and repeat outbreaks in 4 from different causes.

7. The courts in both the United States and Canada are increasingly holding cities and water companies liable for heavy financial damages for illness resulting from pollution of public supplies.

Epidemiological Study of 383 Cases of Meningococcus Meningitis in the City of Milwaukee, 1927-1928 and 1929*

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SOME communicable diseases such as smallpox, diphtheria, and typhoid fever can now be definitely prevented or controlled through the use of our present-day knowledge of medical science. Other communicable diseases, however, particularly meningococcus meningitis, appear now and then to take their toll of human lives. The methods of prevention or control have very little influence on the progress of this disease.

Meningococcus meningitis began to show an increase above its normal expectancy in Milwaukee, an industrial city of 575,000 population, in December, 1926. During the following 3 years, 1927, 1928 and 1929, it was prevalent in the city, and 383 definitely confirmed cases, with 208 deaths, occurred during this time.

There were 2 large epidemic waves. The first started in December, 1926, and reached its peak in April, 1927, fell to a fairly low point in August, but was still above its expectancy. The disease again increased somewhat in October and November, fell in December, and showed a small rise in March and April of 1928, then fell for the first time below its normal expectancy in August. The second began in October, 1928, reached its peak in March, 1929, and then during the following months dropped until September when it fell below its expectancy. In November and December it rose slightly, but in January, 1930, the disease fell below its norm, and during the past 9 months of 1930 has continued low. The wave of 1927 and 1928, with the smaller waves, continued for 19 months; and the second starting in October, 1928, continued for 12 months. There was a very definite seasonal incidence of these waves, which reached their peaks in the early spring months, March and April.

* Read before a Special Session on Meningitis of the Laboratory, Health Officers, and Epidemiology Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

The cases of meningococcus meningitis, although somewhat scattered, were more prevalent in certain parts of the city. One area in the center of the city just west of the Milwaukee River, in a radius of 45 square blocks, had over 58 cases. This area contains a mixed population, and is commonly called "The League of All Nations," because there are at least 20 different races and nationalities in that locality. It is also a very congested and very poor district. East of this area, across the river, there was another group of cases composed largely of Italians. In the lower part of the city was the third group, made up very largely of the Polish. Forty-three of the cases were persons living in neighboring communities, who were brought to local hospitals for treatment.

The ages of the persons with meningococcus meningitis ranged from a few days to 60 years. The largest number of cases was in the preschool age group, 1 to 5 years, followed closely by the school groups, 6 to 10, and 11 to 15. These groups were followed by babies under 1 year, and next were the adults, with a decrease in cases as the age increased (Figure II).

Almost twice as many males had meningococcus meningitis as females. There were 235 males compared to 148 females. This larger proportion of males to females was evident in all of the age

FIGURE I

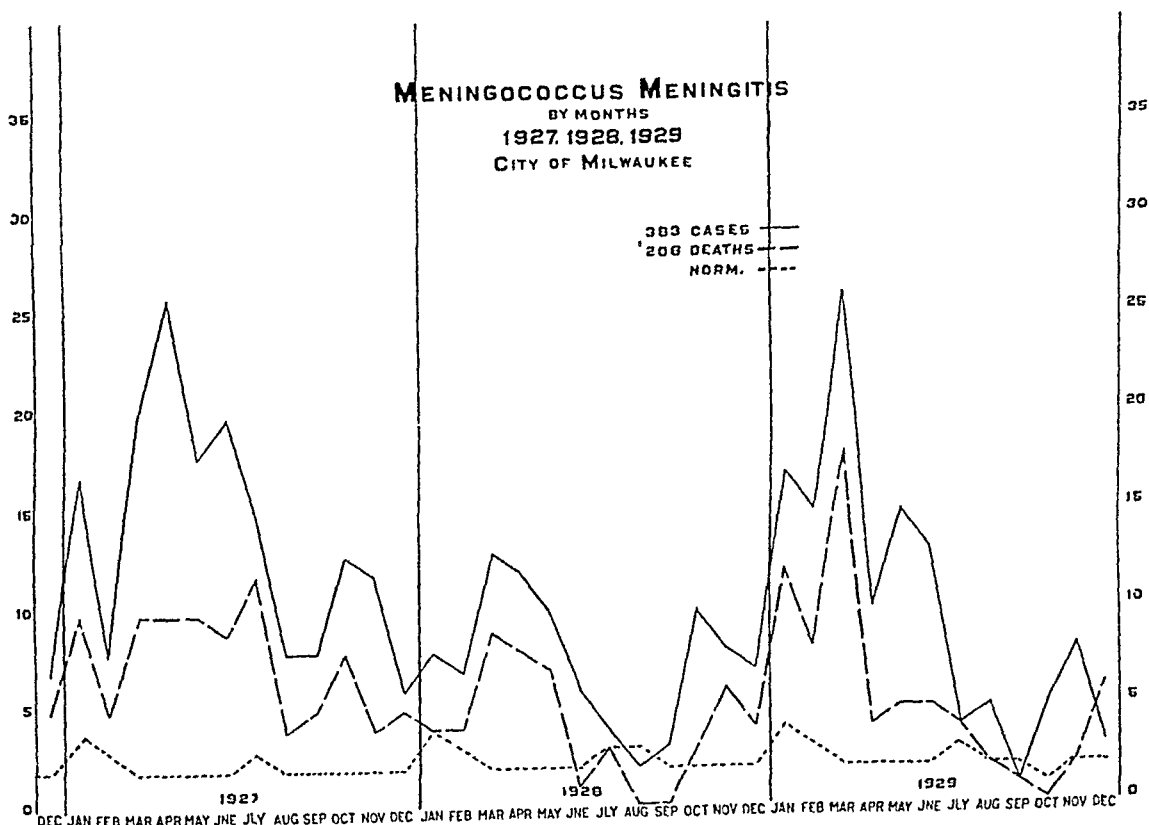
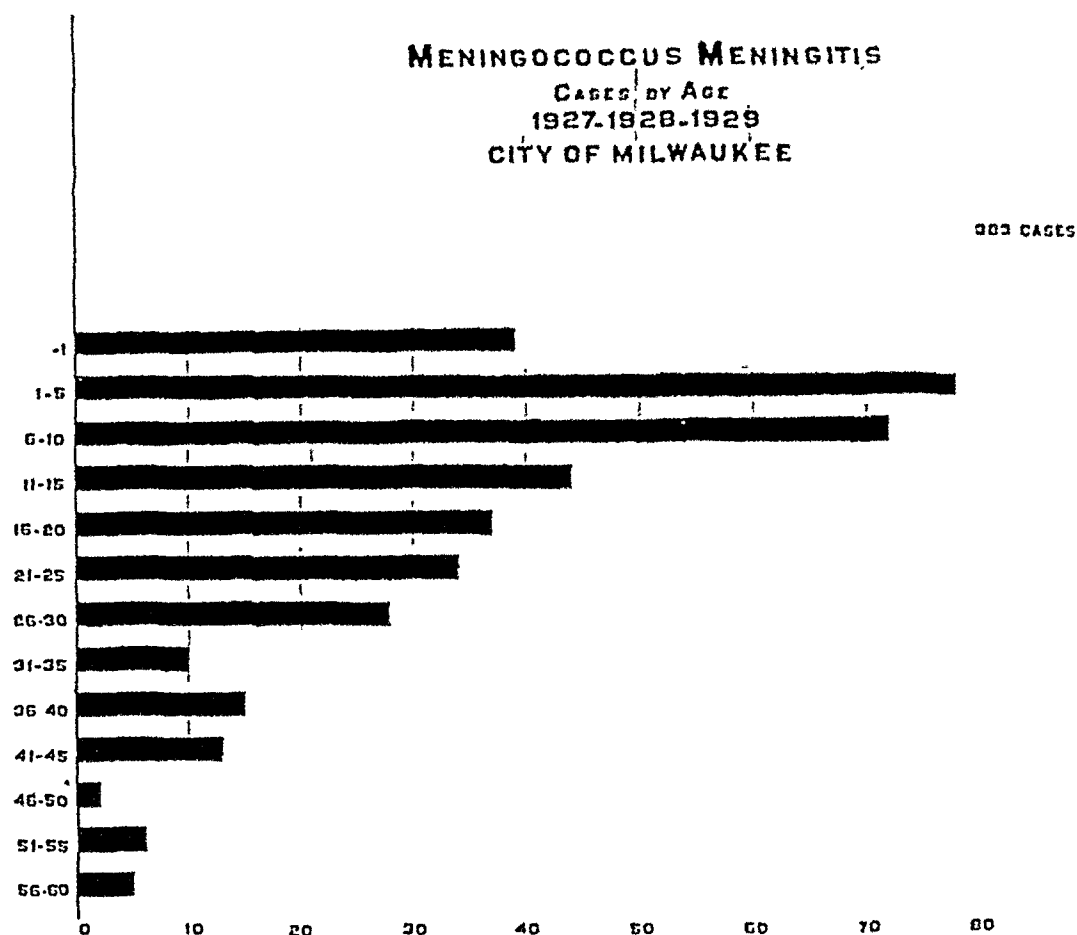


FIGURE II

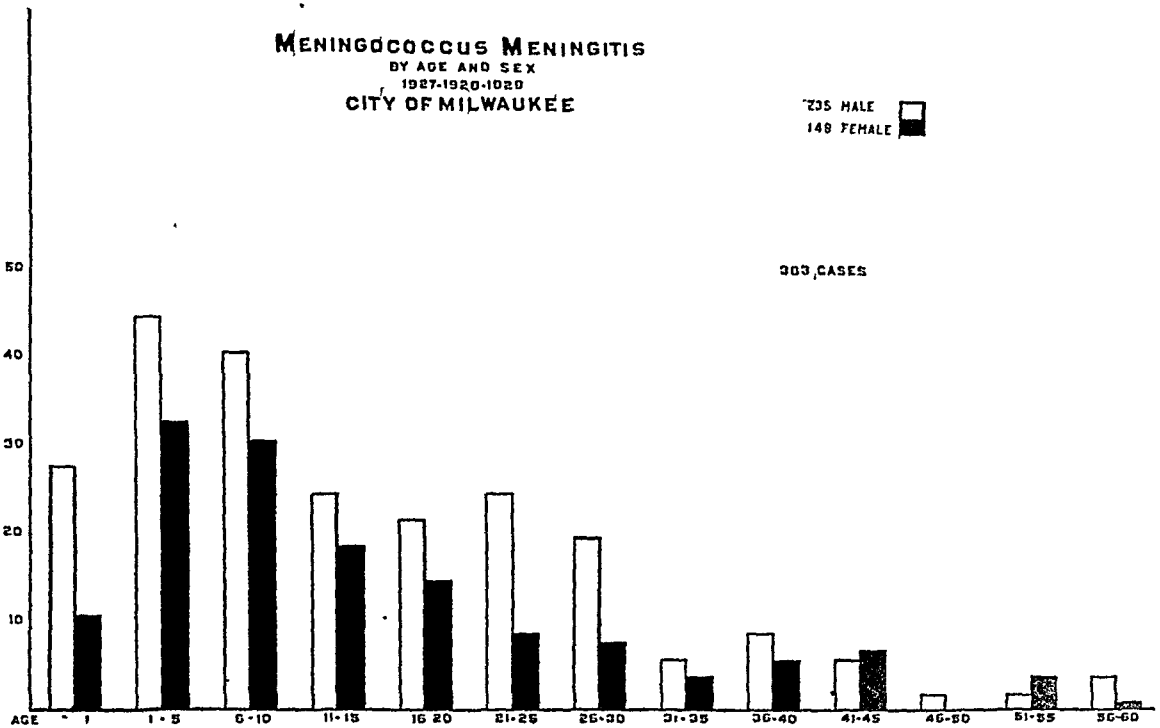


groups with the exception of the groups 41 to 45 and 51 to 55, in which the females were in the larger proportion (Figure III).

Eighteen different races or nationalities and one unknown group were represented in the 383 cases. The nationality of these groups portrays country of origin, and not necessarily country of birth. The American group was a mixed one in which the parentage was made up of many different nationalities. The American, Polish and German nationalities lead in the number of cases, followed by the Negro and Jewish races, then by the other nationalities of Europe, Ireland, and Mexico (Figure IV).

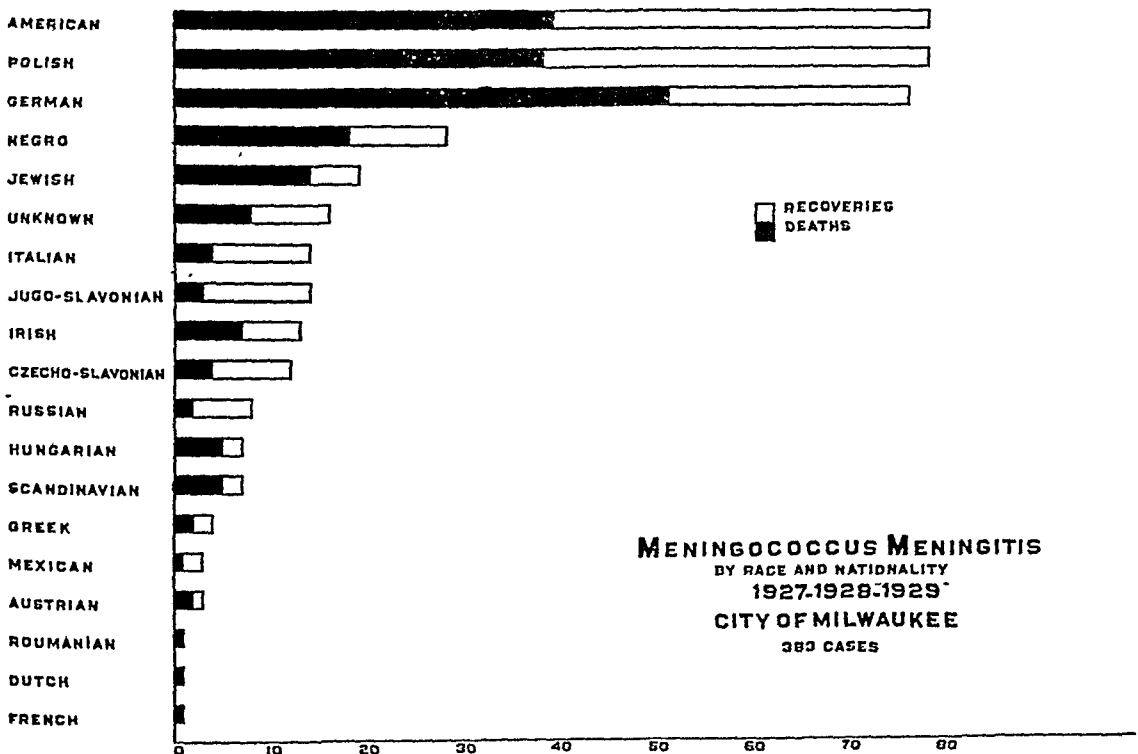
The Negro race, 4th in number of cases, has during the past few years shown a marked increase in Milwaukee. There were only 2,000 in the city according to the 1920 census, while in 1927, according to a report from the Milwaukee Urban League, there were between 8,000 to 10,000. This increase was very largely due to the influx from the southern states; and the Negro race coming from a mild climate to a northern one, and living in unfamiliar conditions, was found to be rather susceptible to this disease.

FIGURE III



The schools played no part in the spread of meningococcus meningitis, although a number of cases were among school children. One case was found in each of 52 schools; 2 cases each in 10; 3 cases each in 7; 4 cases each in 2; while in 1 there were 5 cases. However, there was no relationship between these cases for they developed at different

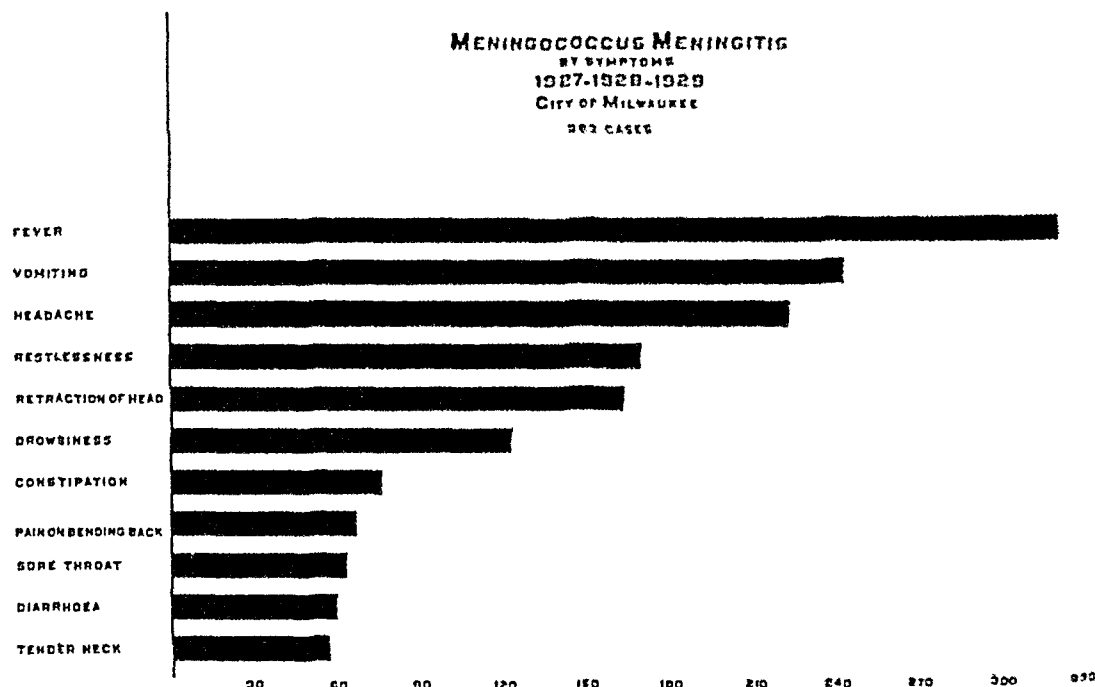
FIGURE IV



times and there was no association or contact between them, as they were children in different classes.

The common symptoms complained of were largely those usually found at the beginning of a communicable disease, with some localization of infection in the central nervous system. The most common symptoms found in the 383 cases were fever accompanied by vomiting, headache of a very persistent and severe type, restlessness and some retraction of the head, drowsiness from which it was difficult to arouse the patient, and constipation. In some cases the patient complained of pain in the back on bending the body backwards. A sore throat or a cold very frequently ushered in the disease, while diarrhea and tenderness of the neck on bending the head back were present in a number of cases.

FIGURE V



Meningococcus meningitis had a rather high fatality, which was about the same for each of the 3 years.

In 1927 there were 92 deaths and 79 recoveries, a case fatality of 53 per cent; in 1928, 49 deaths and 41 recoveries, a case fatality of 53 per cent; in 1929, 67 deaths and 55 recoveries, a total for the 3 years of 208 deaths and 175 recoveries, a case fatality of 54 per cent.

The case fatality varied somewhat in the different age groups, the highest being in the age groups 41 to 45, and 46 to 50, in which all of the 15 cases died, a case fatality of 100 per cent.

Next came the babies under 1 year, with a case fatality of 84 per cent; followed very closely by the groups 51 to 55, and 56 to 60, in which the case fatality was over 80 per cent.

The groups with a case fatality of 60 per cent and over were adults 26 to 30, 31 to 35, 36 to 40; followed by the age group 16 to 20, with a case fatality of 57 per cent; and next those of preschool age 1 to 5 with a case fatality of 40 per cent. The group with the lowest case fatality, 36 per cent, was that of 11 to 15 years of age.

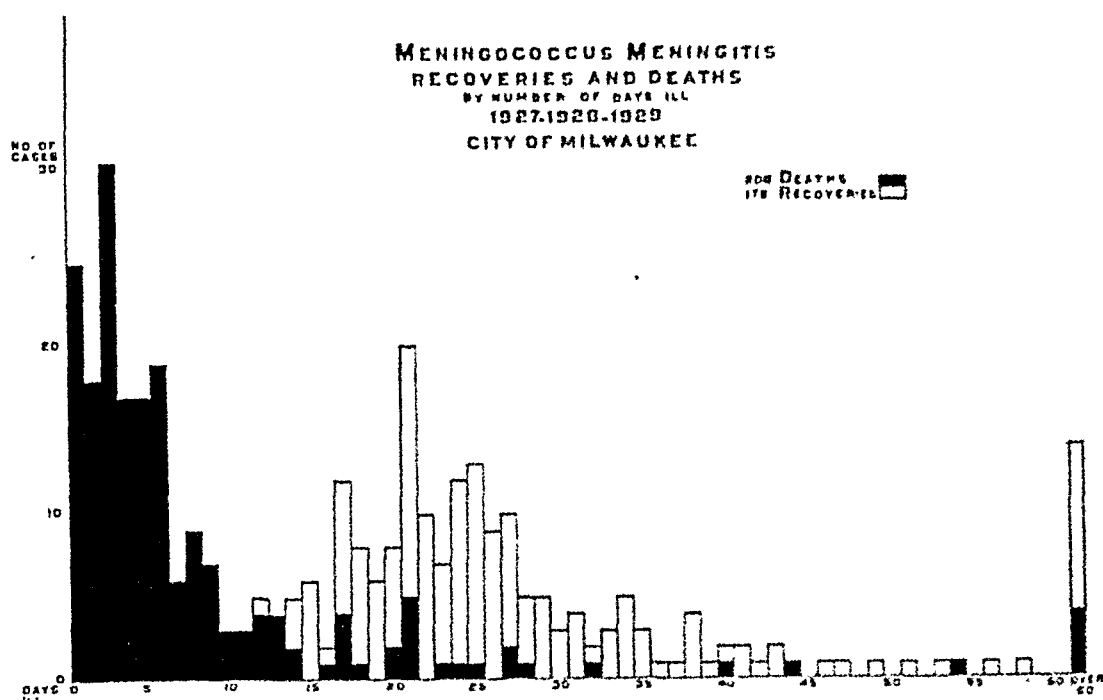
The largest proportion of cases were treated in local hospitals, only a few being treated at home. One hundred and sixty-one cases were cared for in the Municipal Contagious Disease Hospital, known as South View Isolation, where 61 died and 100 recovered, a case fatality of 37 per cent. In 10 other hospitals in the city 152 cases were treated, 95 died and 62 recovered, a case fatality of 62 per cent; while in the homes where 70 cases were treated, 52 died and 18 recovered, a case fatality of 74 per cent. All of these cases in the various hospitals and homes represent different types of infection, from those who were overwhelmed and died within a short time, to those who had some resistance and fought the disease for a certain length of time without serum treatment. The Municipal South View Isolation Hospital, which had the lowest case fatality rate, used routinely the cisternal puncture in treatment with the other methods, and found it to be safe and efficient.

The first few days of illness were the ones of greatest danger for the life of the patients, for 60 per cent of all deaths occurred during the first 6 days of illness. The largest number of deaths occurred on the 3d day, followed closely by the 1st, 6th, 2d, 4th and 5th days. Deaths continued to occur, however, during the following days, decreasing as the number of days of illness increased.

No recoveries were reported until the 12th day of illness, and from that time on through the 35th day over 77 per cent of all recoveries had taken place. The largest number of recoveries were from the 21st to the 26th days of illness. However, recoveries continued to be reported for as long as 60 days and over from date of onset (Figure VI).

A large number of adults and children were exposed, but did not develop it. Eight hundred and forty adults and 690 children contacts, under 17 years of age, were closely associated with persons who had meningococcus meningitis, and showed no symptoms of this disease. Three hundred and forty-six persons developed meningococcus meningitis and no further cases occurred among the immediate contacts or associates in the family; while in 17 different families there were 2 or more cases in each, or a total of 37 multiple cases.

FIGURE VI



In 3 of these families, Nos. 4, 15, and 16, where multiple cases occurred, there were 3 cases each, while in the other 14 there were only 2 cases. In all of the homes with the exception of the first 3 there was an interval of a few days between the onset of the first case and the others. In the first 3 the dates of onset of the 1st and 2d cases were the same.

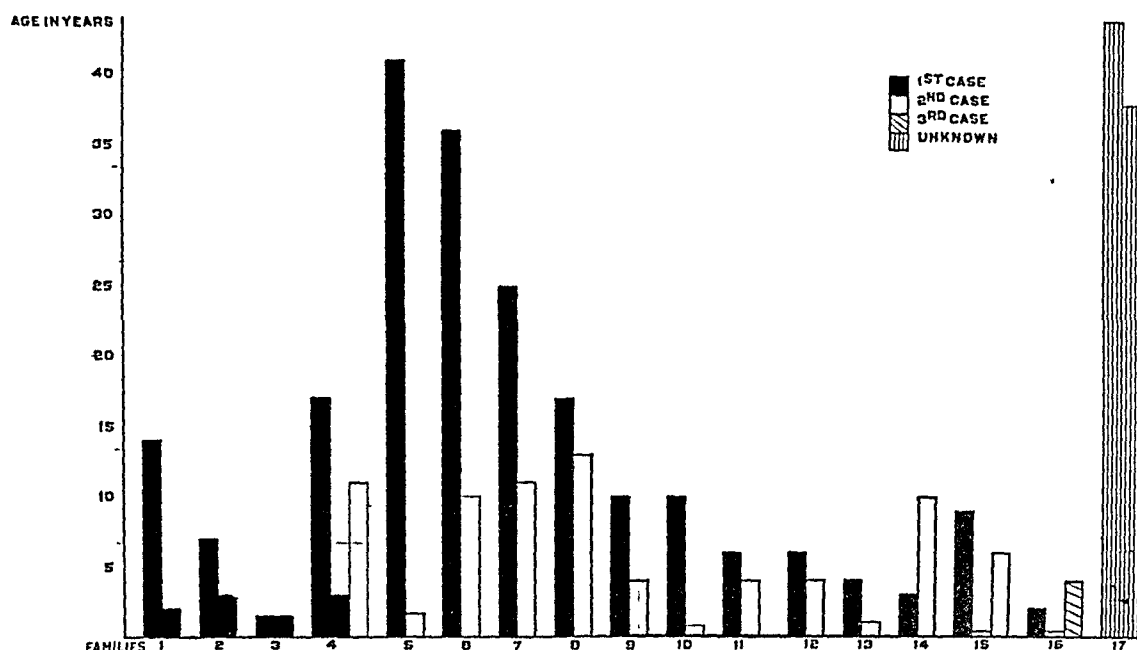
Information concerning family No. 17 is somewhat uncertain because both cases, a husband and wife, were taken out of a burning building in a semi-conscious condition to the Emergency Hospital where it was found that they had meningococcus meningitis, and they died before complete information could be obtained.

As a rule the older persons in the family developed the disease first, with the exception of families Nos. 14, 16, and 17 (unknown). This was especially noticeable in family No. 5 where the mother, the 1st case, developed the disease 3 days before her 19 months old baby came down. Also, in family No. 6 where the father, 36 years old, developed the disease 7 days before his 10 year old son, both slept together just prior to the onset of their illness. In family No. 7 the 25 year old uncle developed the disease 3 days before his 10 year old niece.

The interval between the onset of these multiple cases in the homes varied from the same day to $8\frac{1}{2}$ months. Eight multiple cases developed the disease on the same day in their respective families, indicating a common source of infection in the home; 20 developed within

FIGURE VII

MENINGOCOCCUS MENINGITIS
 37 MULTIPLE CASES BY FAMILIES, TIME OF ONSET AND AGE
 1927-1928-1929
 CITY OF MILWAUKEE



1 to 8 days; 3 developed within $2\frac{1}{2}$ months; 2 cases in $8\frac{1}{2}$ months; and the interval for 2 was unknown.

All of the contacts with cases of meningococcus meningitis had postnasal cultures taken to detect possible carriers. The percentage of carriers found varied from an average per month of less than 1 to as high as 30 positive.

All carriers were isolated until two consecutive negative cultures were obtained, and as a rule they cleared up rather quickly; 12 days being the longest time that any was held. The culturing and isolation of these carriers seemed to have little or no influence in preventing the spread of this disease.

SUMMARY

Meningococcus meningitis was prevalent in the City of Milwaukee for 3 years, with 383 cases, resulting in 208 deaths. The cases, although scattered, were more prevalent in certain congested parts of the city, and there was a high seasonal incidence in the early spring months of March and April. The ages varied from less than 1 year to 60 years, the highest proportion being in the preschool age group under 5 years, and there was a larger proportion of males than females. The American, German and Polish nationalities lead all others in number of cases.

The schools played no part in the spread of this disease, although a number of school children had it.

The morbidity, or number of cases that developed, was not influenced by the culturing or isolation of carriers. The case fatality rate, however, was influenced by the age of the patient, being highest in the age group 41 to 50, and under 1 year. It was also influenced by the kind of treatment given, being highest in those treated in the homes and lowest in the hospital where the cisternal method was used routinely. The largest number of deaths occurred during the first few days of illness, and the patients who lived through the first 6 days had a fair chance of recovery.

The possibility of intimate contacts developing meningococcus meningitis was very slight, for less than 1 per cent of those exposed developed the disease. The older ones in the family, where there were multiple cases, as a rule, developed the infection first, and in no instance did an adult develop the disease after a child in the family.

Exit the Milkmaid

"Where are you going, my pretty maid?"

"To look at the merry-go-round," she said.

"Will you ride on it with me, my pretty maid?"

"Oh, no, sir; it's just for the cows," she said.

In some such fashion the old nursery rhyme must be remodeled to celebrate the machine's latest triumph—elimination from the scene of the milkmaid, with her wooden pail, three-legged stool and fly swatter. The new rotolactor, as installed at a dairy near Plainsboro, N. J., seems certain to make that romantic rural creature a constant reader of the "Help Wanted" columns. The device is nothing more than a slow-motion merry-go-round, without music, on which the cows, 50 of them, ride while a milking machine does the milkmaid's former duty.

First, however, Bossy gets a bath from a hose; then she is dried by hot air, and finally she is milked while riding gracefully around the barn, with another cow waiting to take her place when the circuit is completed. True, the milking is done under more hygienic auspices, and in less time than it would take the milkmaid to remove Bossy's tail from the bucket. But the passing of a picturesque calling is to be lamented, particularly when other feminine fields are overcrowded with too many permanent wavers, Hollywood aspirants and woman stunt flyers.—*St. Louis Post-Dispatch*, Jan. 21, 1931.

An Epidemic of Cerebrospinal Meningitis in Saginaw, Mich.*

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(Formerly, Health Officer of Saginaw)*

SAGINAW is a city of approximately 85,000 population, composed of white, brown, and black races. It was a great lumbering center in its earliest days, but during the past decade has developed into an industrial and agricultural center. On account of its extensive industrial development, laborers have moved into the city from all parts of the United States, Canada, and Mexico.

The first knowledge that the local Health Department had of the presence of meningitis in Saginaw was on February 13, 1929, when it was accidentally learned that there were 5 cases in one hospital and 2 in another. This number of any type of meningitis cases demands an immediate investigation, which was made, and the 7 cases were promptly segregated in the two public hospitals. All close contacts were cultured for possible carriers.

Owing to the seriousness of this disease, the extreme restlessness of the patients, and the difficult treatment necessary, it was determined to hospitalize all cases if possible. Saginaw did not have a contagious disease hospital when the epidemic began and only after a humanitarian plea was made at a joint meeting of the boards of the two institutions mentioned was it possible to obtain adequate hospitalization for the cases which subsequently developed.

All culturing of cases was done by the local laboratory. This policy was adopted for three reasons: (1) it would cost less than the employment of additional personnel who would be compelled to have special laboratory training; (2) the meningococcus does not live at room temperature long enough to get to the laboratory with swabs, without incubation at body temperature; (3) the swabs are best taken by a person having a thorough knowledge of the peculiarities and characteristics of these germs, especially as to their habitat in nature or

* Read before a Special Session of the Laboratory, Epidemiology, and Health Officers Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

location in the posterior wall of the nasopharynx, and an understanding of the measures employed to guard against contamination of the swab by saliva.

A large epidemiological chart of all cases was kept in the Health Department office, on which the following information was recorded: name of patient, number of case, hospital or home case, death or recovery, exposure to healthy carriers, residence address, milk supply, color, age, sex, type and place of occupation, types and places of occupation of other members of the family, school and grade, date reported, attendance at dances, churches, theaters, Sunday schools, bathing pools, parties or other public or private gatherings, during 14 days prior to illness. With this chart before him, the health officer was enabled to detect a common factor in any 2 or more cases and be guided in his actions.

MANAGEMENT OF CASES

Cases or suspected cases were hospitalized promptly. Since the treatment is heroic and difficult to administer in the home, hospitalization was insisted upon. This enabled the physicians to render maximum treatment with minimum danger to the patient. No patient was released from the hospital or home until 2 successive negative cultures taken from swabs of the nasopharynx, 24 hours apart, were reported by the laboratory, and not until after the 14th day from the onset of the disease under any circumstances.

All cases except 11 were hospitalized, and of these 11 who refused hospitalization 7 died. These families were rigidly quarantined for a minimum of 14 days except the breadwinners, who were released after the first negative swab and allowed to reside elsewhere so as to carry on their occupations.

Thorough cleaning, disinfection, exposure to fresh air, and sunlight were required for all homes when cases were removed or after recovery.

The field investigations of the cases failed to show contact between known cases or a common source of infection. Moreover, since no relationship was established as to sex, color, age, milk supply, occupation, residence, habits, etc., it was postulated that the disease was spread by healthy carriers.

MANAGEMENT OF CONTACTS

The indiscriminate culturing of groups of casual or transient contacts was not done except when as many as 2 cases occurred among a small group, and then only after the group survey indicated the necessity. At no time during the epidemic did secondary cases occur out-

side of a few large families where the homes were small and the living conditions crowded and intimate.

Contacts were taken by their own private conveyances or carried at county expense to the laboratory for culturing, and then returned home to remain in quarantine until negative reports were received for each of the 2 separate 24-hour cultures. If the reports showed that there were no carriers found among any of the close contacts, all bread-winners were promptly released, but all school children or other members of the families were kept at home for 7 days irrespective of the negative laboratory reports. If a carrier was found among the contacts, he was placed under placarded isolation in a room alone, with separate eating, drinking, toilet and sleeping facilities until 2 successive negative cultures were obtained by the laboratory after the 7th day. No carriers were kept in isolation longer than 14 days, and those showing a positive culture were carefully instructed upon release.

GENERAL DATA

This epidemic resulted in 264 cases and 85 deaths. The cost to the county for proper care of these cases and contacts was \$60,000. This sum is indicative of the fact that a majority of the cases were among families of the lower economic group.

A very small minority of the population, including 1 physician and

FIGURE I

CITY OF SAGINAW EPIDEMIC MENINGITIS

Comparison of the leading causes of death July 1, 1928 to July 1, 1929

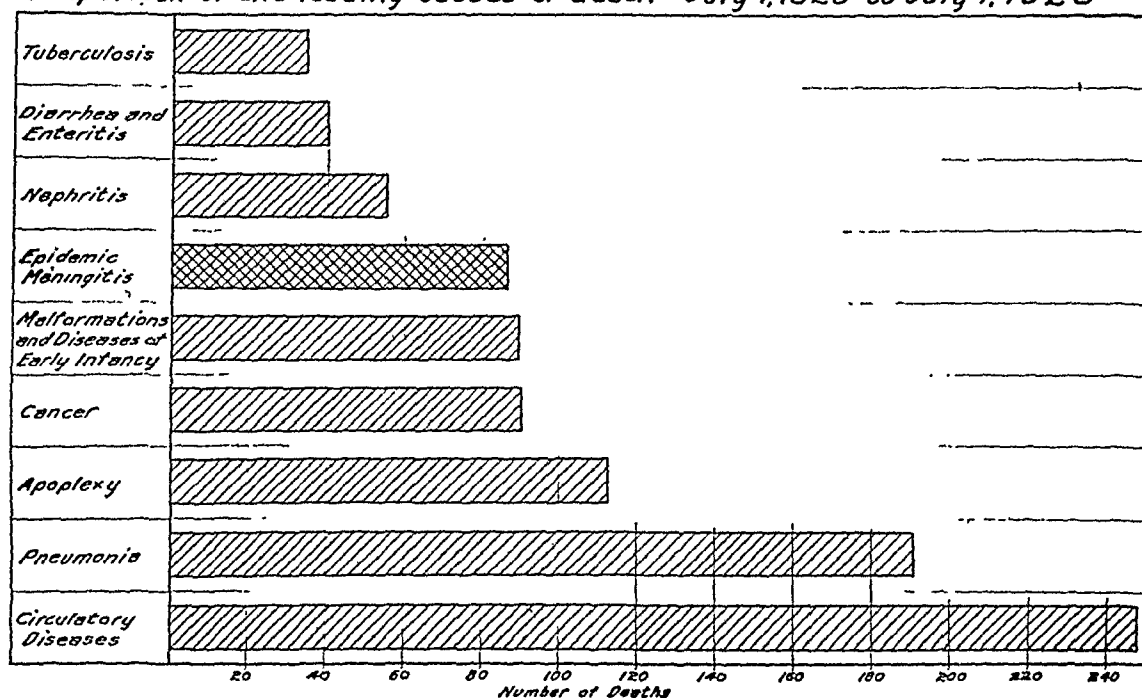
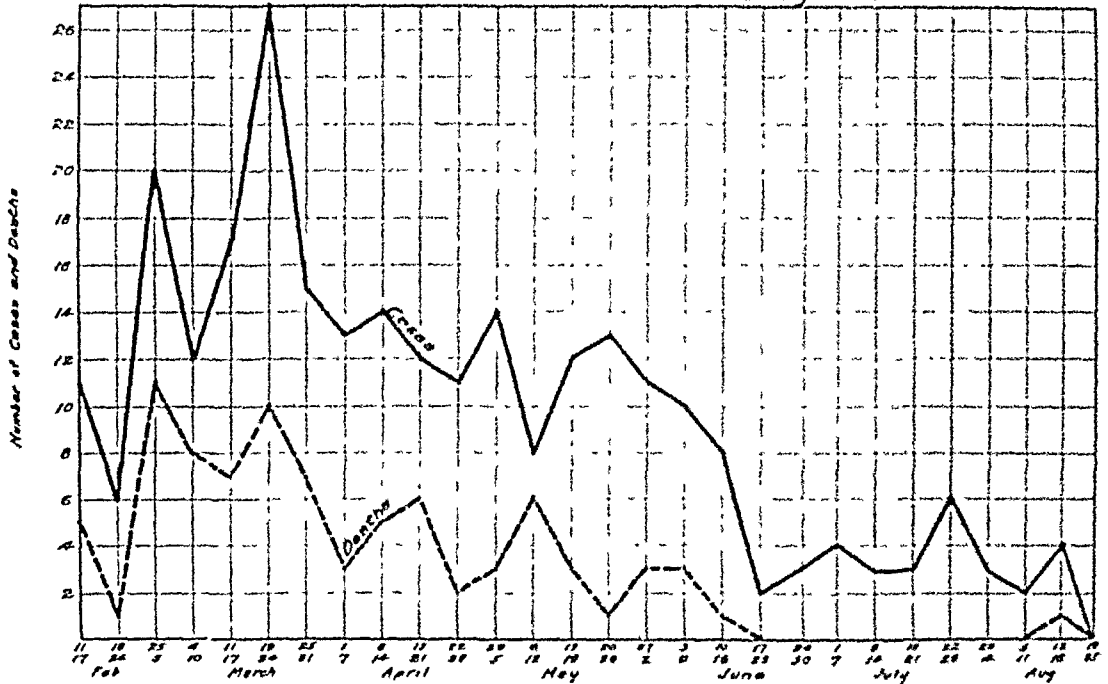


FIGURE II

CITY OF SAGINAW
EPIDEMIC MENINGITIS
Incidence of Cases and Deaths by weeks



1 dentist, during the first few weeks listened with over-anxious ears to greatly exaggerated reports and caused the Health Department no small amount of unnecessary trouble as well as extra work in proving the rumors untrue. These few hysterical persons did not seek first hand information, and except for the medical profession and the newspapers, who were kept truthfully informed, might have caused more damage to business, school attendance, etc., than even a much more serious epidemic could have done.

The State Health Department was asked to send a consultant on 3 or 4 different occasions, and on each visit the local Health Department as well as the public was advised that all was being done that could be done to produce the best possible results.

Figure I shows how prominent a part epidemic meningitis played as a cause of death among the nine leading diseases in Saginaw during the year July 1, 1928, to June 30, 1929.

Figure II shows cases and deaths from epidemic meningitis by weeks from February 11, 1929, to August 27, 1929, inclusive.

It will be noticed that the peak of the epidemic appeared early during the sixth week, and from that time on there was a more or less steady decline in cases and deaths.

DISTRIBUTION OF CASES

Geographical—Every ward had at least 2 cases and in the 1st and 21st the cases greatly outnumbered those in any others. In these two wards, the population is composed of a mixture of white, colored and Mexican families and there is much crowding as well as poor sanitation. It is not possible to learn the population by wards at this time, so a word picture instead of actual figures must be used. There is a very large industry located in the midst of the 1st and the 21st wards, which during the 18 months preceding the epidemic doubled its capacity, and as a result many laborers came from all parts of the United States and Mexico, many of them locating as near the plant as possible in houses which were already full. Since there were no vacant houses, there was, and is yet, only a partial relief to the crowded condition in these homes.

Racial—Figure III shows cases and deaths distributed according to color.

CITY OF SAGINAW
EPIDEMIC MENINGITIS
Cases and Deaths by Race 1929

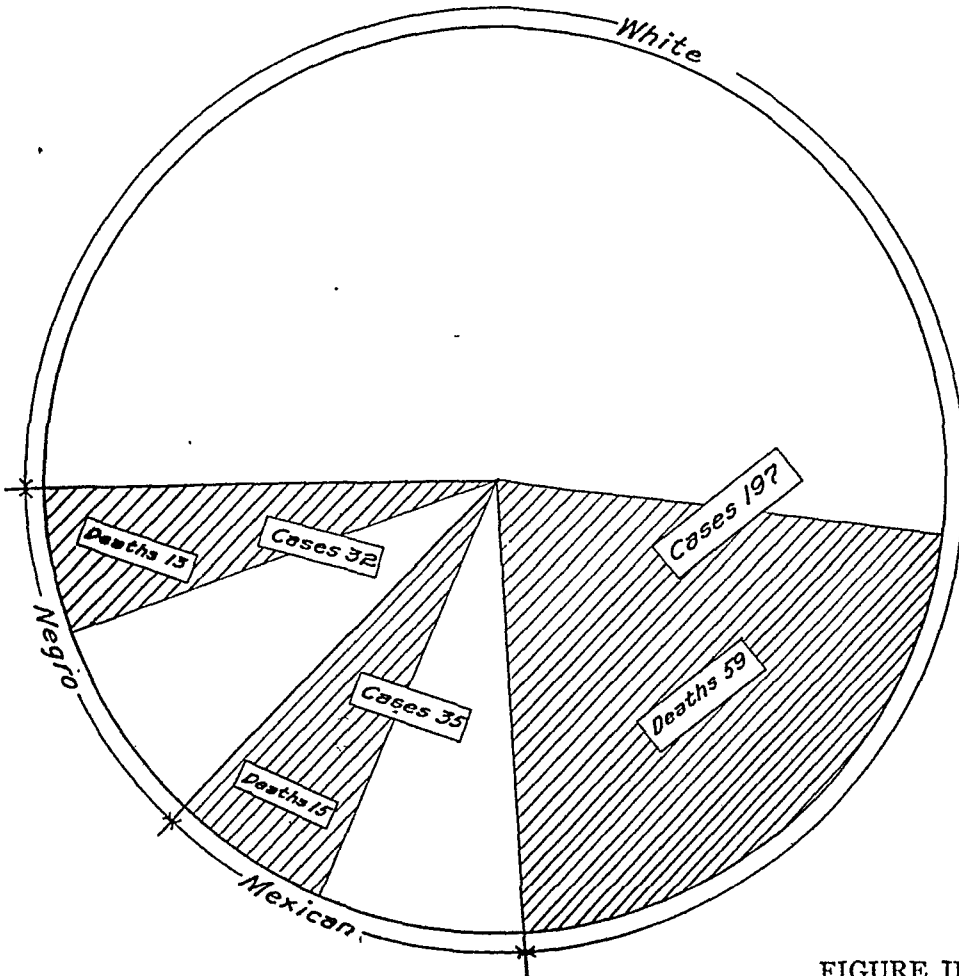


FIGURE III

CASES AND DEATHS BY RACE

White cases	number	197	Deaths	59	Fatality	per cent	30
Negro	"	32	"	13	"	"	40
Mexican	"	35	"	15	"	"	43

The proportion of Negroes and Mexicans in the general population of Saginaw is not known, but on the basis of their estimated proportion the number of cases of meningitis was higher among these two groups than among the white population.

The colored and Mexican patients received the same quantity and quality of hospital and professional treatment as did the white; consequently, less resistance to the disease is suspected as being the factor responsible for the higher fatality. Change of climate, crowded and unhygienic general living conditions and poor personal hygiene were no doubt important contributing factors.

It may be of interest to note that of the 32 Negro cases 26 came from rooming houses and that only 11 carriers were found among the close contacts. Among the 35 Mexican cases, 29 came from rooming houses or homes with more than 1 family living in them and 16 carriers were found among the contacts.

Occupational—The occupational distribution shows that among 66 industrial cases 14 different callings were represented, with the greatest number of cases coming from the very large industry located in wards 1 and 21.

Housewives developed the disease and in each instance the home work had been done by the patient.

School—Among 61 cases occurring among school children, 31 schools were represented, and only in 2 instances did as many as 2 cases occur in 1 schoolroom. The children in the 2 rooms were cultured and no carriers found, but adult carriers were found at home in 1 of the 2 instances.

Source of Milk Supply—The distribution of cases according to milk supplies is interesting in that for the 264 cases there were 26 separate sources. Like every other group of possible sources, milk was ruled out, leaving the healthy carrier as the only possible source.

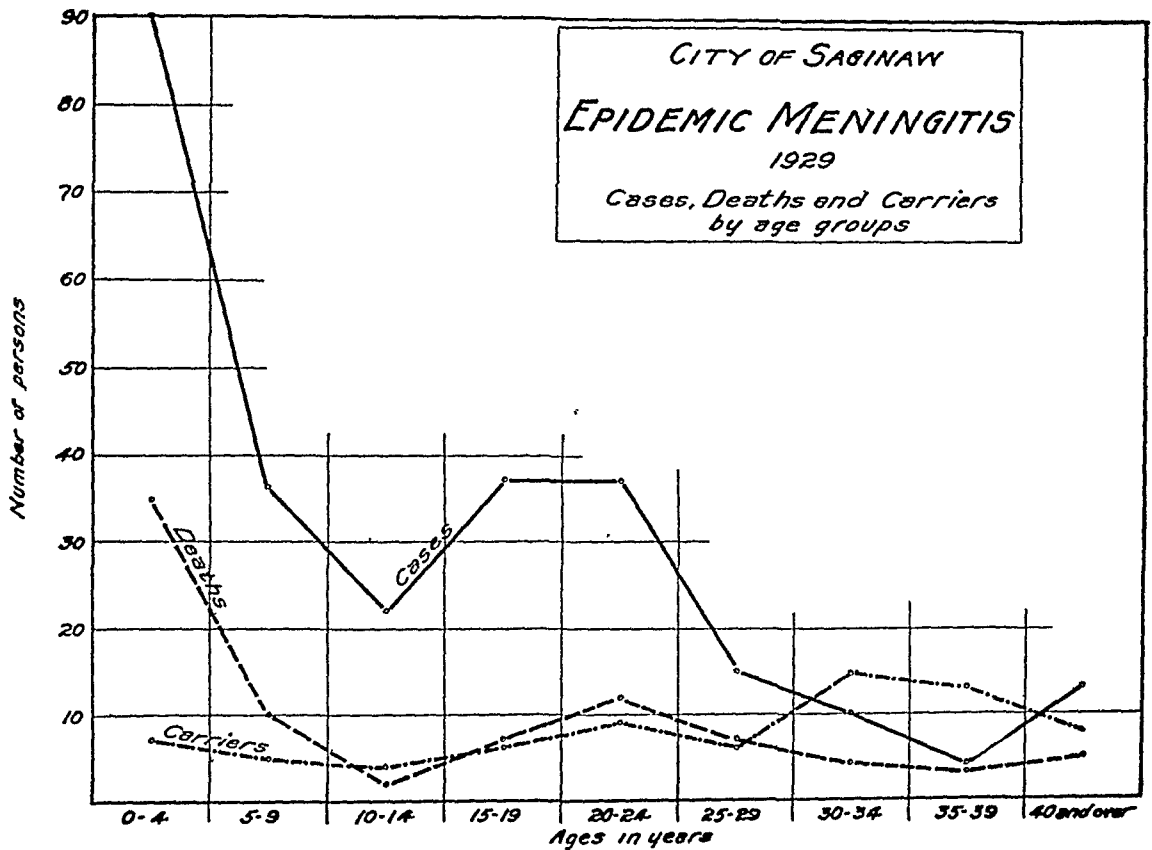
AGE GROUPS OF CASES, DEATHS AND CARRIERS

Figure IV shows the cases, deaths and carriers distributed according to age groups in 5 year periods.

It is at once noticed that cases and deaths are highest among the young—from birth to 4 years—and are lowest among the school age groups. It is more interesting to note the excess of carriers found among adults over those in the very young or school age groups.

There were approximately 500 cultures taken among the close contacts of which 73, or 14 per cent, were positive. None of the 73 carriers had any symptoms of the disease. About 4 per cent remained carriers after the 14th day; all others gave 2 negative cultures by the 10th day.

FIGURE IV



SECONDARY CASES AND RECOVERED CASES

In 2 instances, there were 3 cases in a family, and in 9, 2 cases in a family. All other cases came from homes or boarding houses where only 1 case per house developed.

Following is a summary of defects, classified more or less according to parts of the bodies affected, determined by a survey of physical conditions among recovered cases, 2 to 7 months following discharge from quarantine.

Many of these so-called recovered cases have several of the above conditions. In 2 instances, after the patients had made apparently complete clinical recoveries, they suffered relapses. Symptoms appeared exactly like those of the first attack 2 months previously. No meningococci were isolated during the second attack from either the spinal fluid or the throats.

SUMMARY OF DEFECTS 2 TO 7 MONTHS AFTER DISCHARGE

Well and in good health	66	Motion of arms affected	4
Defective hearing	24	Markedly underweight	3
Defective vision	18	Defective speech	3
Very nervous	15	Stiffness in muscles of neck	2
Tire easily and on part time work	13	Enlargement of joints	2
Pain in back	12	Persistent sore spot on spine	1
Stiffness in lower limbs	11	Nephritis	1
Instability of mind	6	Scoliosis	1
Severe headaches	4		
Returned to hospital second time	4	Under physician's care when visited	27

SUMMARY

Experience gained during the Saginaw epidemic of cerebrospinal meningitis indicates that the following measures are of great importance:

1. Immediate hospitalization of cases
2. Immediate use of serum for cases only
3. Quarantine and multiple culturing of all cases
4. Multiple culturing of close contacts only
5. Keeping the public truthfully informed as to the
 - a. progress of the epidemic
 - b. nature of the disease
 - c. precautions necessary

Futility

HE brushed his teeth twice a day with a nationally advertised toothpaste, reports Louis L. Morris, editor of the *Hartwell, Ga., Sun*. The doctor examined him twice a year. He wore his rubbers when it rained. He slept with the windows open. He stuck to a diet with plenty of fresh vegetables. He relinquished his tonsils and traded in several worn out glands. He golfed, but never more than 18 holes at a time. He got at least 8 hours sleep every night. He never smoked, drank or lost his temper. He did his daily dozen daily. He was all set to live to be a hundred.

The funeral will be held next Wednesday. He is survived by 18 specialists, 4 health institutes, 6 gymnasiums and numerous manufacturers of health foods and antiseptics.

He had forgotten about trains at the grade crossings.—*Western Hospital Review*, Jan., 1931.

Experience of the Meningitis Division of the New York Department of Health*

JOSEPHINE B. NEAL, M. D.

Meningitis Division, Department of Health, New York, N. Y.

THE Meningitis Division of the Department of Health of New York City was established by William H. Park, M.D., in 1910. Its original purpose was to provide a staff of physicians trained in the diagnosis and treatment of meningococcus meningitis. The services of this staff are available to the physicians of New York City and cases are seen only in consultation. The establishment of this division was advisable because the successful diagnosis and treatment of meningococcus meningitis calls for no small degree of experience.

No general rules in regard to the administration of serum can be followed routinely; each case must be treated individually. Cases are seen only in consultation with the family physician, as we wish to co-operate, not to compete, with the general practitioner, and also as the family is better satisfied if its own physician is present.

As time has passed, the scope of the work has expanded to include other forms of meningitis, infantile paralysis, epidemic encephalitis and other acute diseases of the central nervous system. We also see many patients suffering from various diseases in which meningeal symptoms are present without a real infection of the central nervous system.

Laboratory facilities are provided for the examination not only of the spinal fluids of our own cases but also of those sent to us by physicians who are taking care of their patients without our coöperation.

The physicians of the staff of the Meningitis Division are available at any time. Meningitis, poliomyelitis and epidemic encephalitis are reportable to the Health Department. The reports are forwarded to our office. The physicians in charge of the cases are called by us to learn if consultation is desired. At present many physicians call us

* Read before a Special Session of the Laboratory, Epidemiology, and Health Officers Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

directly. One might think that our work has a very limited field. As a fact, the scope of diseases to be diagnosed is a large one. A partial list of diagnoses made during the last 3 years includes the following diseases in addition to the various forms of meningitis, poliomyelitis and epidemic encephalitis: acute miliary tuberculosis, arsenical poisoning, anthrax, alcoholic neuritis, pernicious anemia, brain tumor, brain abscess, brachial palsy with cerebral hemorrhage, concussion of the brain, cerebral congestion with pertussis, chronic inflammatory arthritis, cerebral hemorrhage, cerebral embolism, chorea, cerebrospinal syphilis, dislocated atlas, diabetes, dementia praecox, endocrine imbalance, epilepsy, erysipelas, erythema nodosum, sarcoma of the spine, exacerbation of a chronic nephritis, early diphtheritic paralysis, fibrinous pleurisy, follicular tonsillitis, fracture of the skull, glandular fever, hemorrhage of the spinal cord, hydrocephalus, hysteria, influenza, intraventricular hemorrhage, lead poisoning, Landry's paralysis, meningism with pneumonia, scarlet fever, enteritis, acidosis, otitis media, food allergy, malnutrition, typhoid fever and colitis; meningitis sympathica or serous meningitis with sinusitis, meningeal hemorrhage with bacterial endocarditis, multiple sclerosis, mastoiditis, myelitis, multiple neuritis, Mongolian idiocy, neurosis, neurasthenia, osteomyelitis, pyelitis, phlebitis, progressive muscular atrophy, paralysis following antirabic treatment, parotitis, post-diphtheritic paralysis, post-influenzal asthenia, rheumatism and pericarditis with embolism, retropharyngeal abscess, rickets, Schilder's disease, spontaneous meningeal hemorrhage, subacute spondylitis, status epilepticus, scurvy, spina-bifida, sinus thrombosis, septicemia, typhus fever, tuberculous adenitis, trigeminal neuralgia, transverse myelitis, toxemia of pregnancy, trichinosis, tetany, varicella, whooping cough, methyl alcohol poisoning, encephalitis associated with scarlet fever, pneumonia, bronchial pneumonia, measles and vaccination.

Many of our cases and groups of cases present interesting problems but it will be necessary to limit this discussion almost exclusively to meningococcus meningitis.

Meningococcus meningitis may be divided as follows:

1. Acute forms—

- (a) Ordinary acute forms of greatly varying degrees of severity, in which the patient is well on the road to recovery or is dead within 10 days to 2 weeks
- (b) Fulminating, in which death occurs within 72 hours
- (c) Septicemic type, in which the septicemia is a more striking feature than the meningitis

2. Chronic forms—

- (a) Ordinary chronic form in which the disease lasts 3 weeks or more before there is a decisive change for the better or worse
- (b) Relapsing form
- (c) Form in which the process becomes walled off either in the ventricles producing a basilar meningitis, or in pockets forming the encysted or loculated meningitis

The clinical course of the disease depends to no small degree upon the age of the patient. It is especially severe in infants and in adults over 30.

The space allotted to this paper does not permit a discussion of the symptomatology of all these forms of meningitis. In the ordinary acute form of meningitis, which is the most common, the onset is sudden with headache, vomiting, fever and sometimes chills. Within 24 to 36 hours stiffness of the neck and a positive Kernig and Brudzinski usually develop. A Babinski may or may not be present. A hemorrhagic rash is found in a varying percentage of cases. This usually appears very early in the disease. Petechiae are most common but the rash may appear as macular or purpuric spots. In the great majority of cases it begins to fade in 1 to 3 days. Herpes is occasionally present. In the early stages superficial and deep reflexes are usually exaggerated. As the disease progresses these become less marked and may be lost entirely. They are not infrequently unequal, especially in the later stages. Early the pupils are usually equal and react to light and accommodation; later they often become fixed and may be unequal. Photophobia is quite common in the early stages. There is usually constipation in older children and adults. The temperature is irregular in type but does not show the wide variation of the usual septic temperature.

At the onset of the disease the pulse is generally a little slower than the elevation of the temperature would indicate; in the later stages it becomes more nearly in proportion to the temperature. The respiration is not significant early; late in unfavorable cases Cheyne-Stokes respiration often occurs. The mental condition shows a wide degree of variation. In mild cases the mentality may be normal throughout. In more severe forms there is marked irritability, delirium, apathy or stupor.

While a bacteremia is undoubtedly present early in practically all cases, the organisms have a predilection for the meninges and speedily localize there. In the septicemic type of meningitis, however, there is usually an invasion of the blood stream for several days or even weeks before a meningitis develops, and the septicemia may continue

after the development of the meningitis. In other cases the meningitis develops early and the septicemia and the meningitis continue together. In still other cases there is a prolonged meningococcemia without the development of the meningitis. These are comparatively rare.

In very young children the early signs and symptoms of meningitis indicate a disturbance of the gastrointestinal rather than of the central nervous system. The disease begins rather abruptly, often with vomiting, almost invariably with greenish slimy stools, irregular fever, and irritability. The fontanelle practically always shows increased pressure. The child does not respond to the ordinary methods of treatment for gastroenteritis, but it is not until the disease is fairly well advanced that stiffness of the neck, opisthotonos and changes in the reflexes develop. The case therefore is usually diagnosed and the serum treatment is begun late in the disease. It is for this reason, I believe, that the mortality in the first year of life is so high. Our mortality has been about 45 per cent. Debré said: "In times of epidemic think of meningitis and do a lumbar puncture on every infant sick without apparent cause." It is even more important in our opinion to do this when there is no epidemic.

UNUSUAL FORMS MENINGITIS		
M CATARRHALIS	3	1.2%
PYOCYANEUS	3	1.2%
TORULA	2	0.8%
FRIEDLANDER	2	0.8%
SPOROTRICHA	1	0.4%
ANAEROBIC BACTERIA	6	2.4%

PNEUMOCOCCUS	TYPES
31	I
18	II
27	III
39	IV
115	TOTAL

Whenever a patient shows signs of meningeal irritation, there should be no delay in doing a lumbar puncture. It is only by the examination of the spinal fluid that a definite diagnosis can be made. The symptomatology of all forms of purulent meningitis are so similar that the bacteriological examination of the spinal fluid is essential for the diagnosis. Early cases of poliomyelitis often present a picture not unlike that of early meningitis. The same is true of meningism with a variety of diseases. In the case of meningism, the relief of the increased intracranial pressure is of sufficient therapeutic value to warrant a lumbar puncture, in addition to its value in diagnosis.

MENINGITIS-AGE-ETIOLOGY.

AGE	ELC	IP	PNEUM	STREP	INF	STAPH	BACILL	MISC	TOTAL
1-2-3 MO	28	5	7	13	3	0	2	4	62
4-5-6 MO	75	29	7	9	12	0	0	2	134
7-12 MO	92	102	14	3	13	2	1	8	235
TOTAL (under 1 yr)	195	136	28	25	28	2	3	14	431
1-2 YR	86	183	13	5	19	1	1	4	312
2-3 YR	51	107	8	11	9	1	0	5	192
3-5 YR	118	150	14	11	7	4	0	6	310
5-10 YR	204	135	29	48	5	0	1	8	430
10-20 YR	198	87	18	22	3	6	0	14	348
OVER 20	168	73	51	23	1	5	0	13	344
AGE UNKNOWN	0	12	1	2	2	0	0	2	19
TOTAL	1020	893	162	147	74	19	5	66	2386

FIGURE I

Figure I shows the distribution by age and etiology of more than 2,000 cases of meningitis. During the period in which these cases have been collected, nearly 20 years, there has been no severe epidemic in New York City. In 1917 and 1918, there was a sharp increase in the number of cases, and in 1928-1929, there was an epidemic of rather mild proportions. It shows also that meningitis of all forms is essentially a disease of childhood, and in the case of meningococcus meningitis, by far the largest number of cases occurs in the first year of life. Of course in times of war there are epidemics of meningitis among the young adults collected in the army camps.

In tuberculous meningitis the greatest number of cases occurs in the second year of life. In most instances of the other forms of purulent meningitis, the disease is probably secondary to a focus of infection elsewhere in the body, but it is sometimes difficult or impossible to locate it by clinical examination.

Figure II shows the seasonal distribution of our cases of meningococcus meningitis over a period of 20 years. It will be seen that by far the larger number of cases occurs in the first 6 months of the year. The incidence is

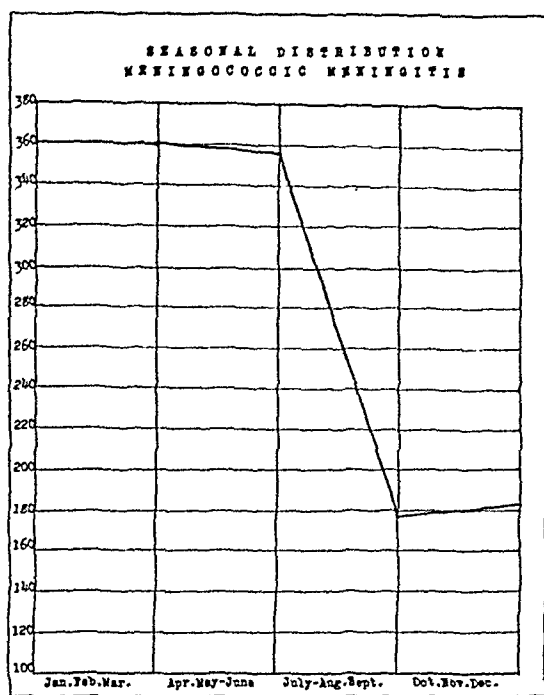


FIGURE II

somewhat larger among males than females. Of 1,007 cases, there were 584 males and 423 females. Meningitis is a disease to which there is apparently a high natural immunity. In our experience, there have been only 24 instances in which there was more than 1 case in a family, or a clear history of exposure. Of these, 10 occurred in 1916, 1917, 1918 and 1919, and 10 in 1928-1929. The reason for this immunity is problematical, but it may be noted that it apparently exists also in the case of poliomyelitis and epidemic encephalitis. Unfortunately, there is no test for this immunity as there is for scarlet fever and diphtheria.

The spinal fluid in meningococcus meningitis is practically always increased in pressure and amount unless there is blocking, and it shows a varying degree of turbidity. Very early in the disease or in the fulminating type, the fluid may show very little cellular reaction. In

the fulminating type there may be enormous numbers of organisms with a nearly clear fluid. As the disease progresses, the number of cells is greatly increased, with polymorphonuclears of 80 per cent or more. The actual cell count is of relatively little value. The number of cells may vary greatly in different portions of the spinal fluid and a high cell count has by no means an unfavorable prognosis.

In examining the spinal fluid the specimen should be centrifuged and smears and cultures made from the sediment. The smears should always be stained by the Gram method. A tentative diagnosis only should be made from the stained specimen, as the Gram positive organisms in other forms of meningitis may decolorize readily in some instances. Cultures should be made on a variety of mediums. Miss Gosling, of our laboratory, has found that a semi-solid medium with 1 per cent glucose, 0.25 to 0.5 per cent agar in beef broth, pH 7.2 to 7.4, is the most suitable, both for isolating the meningococcus and preserving the culture.

As the patient improves, the organisms become more and more intracellular and decrease in number. The protein is increased in varying amounts; the sugar may be normal very early in the disease, but as the disease progresses it practically always is decreased and may become entirely absent. As improvement begins, the protein content usually decreases and the sugar content increases—the latter we consider an important prognostic sign. In some instances it has been noted that a decrease in sugar has preceded the return of organisms when a relapse was about to occur. The identification of the meningococcus is most surely made by the fermentation reactions. It ferments glucose and maltose. A slide agglutination with the anti-meningitis serum is also of value. It is well known that the meningococcus is divided into different types, but they are by no means so clear cut and definite as in the case of the pneumococcus.

During the recent outbreak in New York City, most of the strains fell into Gordon Type I, but there was a good deal of cross agglutination with Type III. It may be recalled that in his original work Nicolle described a Type A as equivalent to the Gordon I and III. The different groupings that have been described by various workers serve to emphasize the difficulty of exactly classifying the various strains. In sporadic cases many cultures are found that fail to fall into any group.

Antimeningococcus serum has been accepted in the treatment of meningitis for about 23 years, and for more than 20 years its use has been very general. It seems a little strange that in spite of this long period there should still be so much difference of opinion in regard to

its proper administration with respect to route, frequency and amount. There are several reasons why this is so. One reason is no doubt the fact that at times serum of poor quality has been used, and in an attempt to save life it has been given in large and frequent doses when a more conservative treatment had been ineffective. When this more intensive treatment also failed, the physician knew little more than before in regard to the relative merits of the two methods. Another reason is, no doubt, that the type of the disease has differed quite markedly in different outbreaks. In certain outbreaks the septicemic form of the disease has been very common. In perhaps the majority of cases, this form is relatively rare. A third reason probably lies in the fact already stated, that each case of meningitis must be studied and treated more or less on its own merits. One can therefore gain a comprehensive view of the disease only after quite extensive experience. It is a great mistake to draw conclusions from the observation of only a few cases.

Our opinion in regard to the treatment of meningitis is based on an experience of 20 years with more than 1,000 cases. During this time we have compared our results with those obtained in institutions where much more radical methods of therapy were employed. Our method is usually as follows: whenever a lumbar puncture yields a cloudy or hazy fluid, antimeningococcic serum warmed to body temperature is immediately administered by gravity. Further serum treatment will depend on the cultural examination of the fluid, but all cases of purulent meningitis are treated as being of the meningococcus type until they are proved to be caused by some other organism. Intraspinal administrations of serum are continued about every 24 hours until at least two successive specimens of the fluid show no organisms by smear or culture.

The dose of serum is usually 20 c.c. if as much or more fluid has been obtained. If the amount of fluid withdrawn is great and the serum runs in easily by gravity, without untoward symptoms on the part of the patient, 30 to 40 c.c. may sometimes be administered. On the other hand, in certain instances when only a small quantity of fluid is obtained we may inject more than the amount of fluid withdrawn provided the serum runs in easily and no unfavorable symptoms result. It is desirable to drain the subarachnoid space as completely as possible before injecting serum, but if the fluid is under greatly increased pressure, care should be taken to withdraw it slowly. Using this precaution, 50 to 60 c.c. or more of fluid may be safely withdrawn. If headache develops during the removal of the fluid, it usually quickly disappears when the serum is injected. Almost the only condition

under which we inject serum oftener than once in 24 hours is when the fluid is under so greatly increased pressure that a puncture at more frequent intervals seems indicated to relieve it. This rarely occurs.

Some physicians have recommended graduated doses of serum for young children, depending rather arbitrarily on the age. We have not found this necessary. We depend rather on the amount of fluid withdrawn and the ease with which the serum runs in by gravity in determining the size of the dose, but it is necessary to exercise more than ordinary care in removing fluid and injecting serum in young babies.

It is rarely safe to give fewer than 4 doses of serum. A case of average severity will require perhaps from 6 to 8 doses, and cases are occasionally seen where 20 or more are necessary before the fluid becomes sterile. As stated, the serum treatment is continued until 2 successive fluids are free from organisms. This is by far the most important indication for stopping treatment. Another indication, of less value, is the return to normal of the spinal fluid sugar. The cell count of the spinal fluid is, by itself, of comparatively little value. When two sterile spinal fluids have been obtained it is usually safe to stop the serum treatment, temporarily at least. It is often necessary to do several lumbar punctures during convalescence for the relief of pressure, and these fluids should be carefully examined and cultured, as the return of organisms would indicate additional serum treatment. I have emphasized the laboratory tests as a guide to the administration of the serum, as it is rare indeed that the clinical picture is not accurately reflected or even predicted by the changes in the spinal fluid. If, however, the symptoms do not improve after the fluid becomes sterile, and the serum has been temporarily discontinued, it is well to resume the injections, as they may be due to a localized meningitis with adhesions which may be favorably influenced by the continued use of the serum.

If signs of blocking develop, recourse should be had to ventricular or cisternal punctures and the administration of serum by these routes. In babies where the fontanelle is still open, ventricular puncture is to be preferred to cisternal as it is less dangerous and more certain of success, since the block is quite as likely to be above the cistern as below it. We have occasionally encountered cases where little or no fluid has been obtained by lumbar puncture and yet serum has run in easily by gravity, and there have not been signs of increased pressure. Several such cases have made satisfactory recoveries without resorting to ventricular or cisternal punctures.

We are, perhaps, more conservative than many in doing ventricular or cisternal punctures. I have never seen any immediate harm follow

a ventricular puncture. On the other hand, comparatively few babies where this treatment has been necessary have recovered. I do not believe that we know at present what may be the after effects of the repeated trauma to the brain tissue. As regards cisternal punctures I do know that death has occasionally followed promptly, due to hemorrhage. It seems unfortunate that these fatalities are not reported, as we not infrequently read accounts of large series of cases without accident written by physicians using this technic in patients with syphilis of the central nervous system. The dangers are much greater, I believe, when there is an active inflammatory process with layers of adhesions in the neighborhood of the cistern, as is likely to be the case in meningitis. Cisternal punctures should be attempted only by those who have had adequate practice on the cadaver.

In regard to the intravenous or intramuscular injection of serum, we believe that this is indicated only in cases of meningococcus septicemia without meningitis, or in those cases of meningitis which show a prolonged invasion of the blood stream by the organisms as indicated by repeated positive blood cultures or a rash that shows a tendency to persist or to recur. While it is probable that in practically all cases of meningitis there is an invasion of the blood stream early in the disease, we think that in the very great majority of cases this invasion is transitory and that injections of serum other than intraspinally are unnecessary. In some instances this has been proved by blood culture and in many more it has been very definitely established by the rapid fading of the rash and the clinical improvement of the patient. The intravenous administration of serum is not without danger, as a severe or fatal reaction occasionally follows. Several such instances have been brought to our attention. Certainly patients tolerate serum much better by the intraspinal than by the intravenous route.

In cases that run a chronic course and in the occasional case that does not tolerate serum, we have used an autogenous vaccine, often with apparently good results. We have given the vaccine both subcutaneously and intraspinally. We are not prepared to claim too much for it as in some cases no benefit has followed its use. My colleague, Dr. Appelbaum, has recently reported a case in which an autogenous vaccine was administered both intraspinally and subcutaneously after sensitivity to serum developed. The patient recovered.

The general treatment and nursing of patients with meningitis are most important. They should be disturbed as little as possible, and if they are restless, sedatives must be administered. Adequate nourishment should be given and the fluid intake must be sufficient. Care should be taken to prevent acidosis. Retention sometimes occurs, so

that catheterization is necessary. Constipation is the rule and enemas or high colonic irrigations are better than purgatives.

Our mortality has varied considerably in different years. From July 1, 1917, to July 1, 1918, 112 patients were treated with a mortality of 19 per cent. From July 1, 1918, to July 1, 1919, 78 patients received treatment with a mortality of 20.5 per cent. Our average mortality has been higher than this. The last 100 cases that were treated under our supervision showed a mortality of 23 per cent. Of the 23 patients who died, 4 had only 1 or 2 injections of serum. One of these had pneumonia also; 5 others had pneumonia either immediately at the onset or during the course of the disease; 1 showed congestion of the lung which was apparently developing into a pneumonia; 1 had a complicating endocarditis; and 1 a brain abscess.

Meningitis is certainly a very serious disease and every effort should be made to produce a more effective serum. We have done some experimental work in producing an antibody. The results are encouraging but the preparation of the antibody is still in an experimental stage.

The sequelae of meningitis are serious but fortunately relatively uncommon. The most important and frequent sequela is deafness. In following up our recovered cases some years ago, we found that nearly 8 per cent had an impairment of hearing or were totally deaf; 2.1 per cent had defects of vision. This usually takes the form of panophthalmitis and is usually limited to one eye. Mental deterioration is most unusual unless there is a hydrocephalus. Paralyzes may occur in the course of the disease, but except for strabismus, they usually disappear. A transverse myelitis is very rare.

The response of many patients to serum treatment is almost spectacular and the results are highly gratifying.

Medicine and the State

SIR ARTHUR NEWSHOLME'S address to the recent public health congress at the Agricultural Hall gave rise to a lively debate, interesting in that the cause of the difference in views in plain and unmistakable language; amusing, depressing, for it shows of opinions expressed, but withal somewhat vaguely de- the State to conserve that in this year of Grace, the fundamental function of caring for the sick.—*Health* is almost entirely overshadowed by its interest in
' *Off.*, Dec. 6, 1930, p. 245.

Practical Problems in the Serum Therapy of Meningococcus Meningitis^{*}

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THE specific therapy of any infectious disease depends upon its pathology in the broadest sense—the character and virulence of the incitant, its distribution in the tissues, and the nature and extent of the pathological processes in the various tissues and organs of the body. Fundamentally, it depends upon the subtle cellular susceptibilities of the invading parasite on the one hand, and of the tissues of the host on the other; hence the importance of information concerning the meningococcus and its various activities in relation to the human subject as a susceptible or relatively insusceptible host. Such information is, unfortunately, quite fragmentary but none the less significant.

Our knowledge of the virulence and pathogenicity of the meningococcus in the experimental study of animal infection is meager because it has been difficult until recently to differentiate between the toxic effects of cultures inoculated into animals and the changes induced as a result of infection, with the development of the organism in the tissues. The widely varying severity of the disease as illustrated by the mild and the fulminating, toxic forms indicates widely varying degrees of susceptibility in the human subject. The fact that in epidemics only a comparatively small proportion of the population is involved, and that the cases are often scattered, suggests general, though relative, insusceptibility. The distribution of the disease processes, largely limited to the meninges, and the comparatively infrequent occurrence of true metastatic involvement of other tissues, despite the bacteremia,† indicate, on the whole, a rather limited susceptibility of the human subject. Nevertheless, the epidemics of fulminating cases must be due largely to the presence of highly susceptible individuals in a crowded community, which is not usual.

^{*} Read before a Special Session of the Laboratory, Epidemiology, and Health Officers Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

[†] Complications or sequelae, however, are not so uncommon.

Were it not for these facts, the severe outbreaks in epidemic form would more reasonably be attributed to the introduction and spread of a particularly virulent strain of meningococcus. Moreover, our studies, as well as those of other laboratories, have failed to identify any one strain that has been associated with the outbreaks on the Pacific Coast, in Chicago, Indianapolis, Detroit, or elsewhere in this country. Finally, the disease is now so generally endemic the world over that conditions of host susceptibility and crowding, especially in large industrial centers and in military camps, must be considered the determining factors in the absence of further data concerning the bacterial incitant.

Since the early work of Weichselbaum, the meningococcus has been detected in the pharynges of patients and also of healthy persons. From this focus infection spreads, involving the meninges, as pointed out by Weichselbaum and others, and also the blood stream as a bacteremia. Since the important studies of Herrick, the bacteremias have been considered especially significant. The dissemination of the organisms from person to person by the secretions of the upper respiratory tract must be quite readily accomplished and it has been found that the number of carriers is in direct proportion to the number of cases. Furthermore, it is evident that each case arises from contact with either a case or a carrier; hence the importance in severe epidemics of the investigation of carriers. Although the practical value of such work is not apparent, the various studies of the carrier state have indicated quite definitely the effect of crowding on the dissemination of the organism. The relative insusceptibility of the human subject and the fact that the carrier state is not usually so persistent as it is in other infectious diseases, such as diphtheria and pneumonia, doubtless account for the practical results obtained by simple measures to prevent crowding as compared with the complex search for, and isolation of, every carrier, a procedure which has not been proved necessary in outbreaks that occur in the civil population.

There has been a definite increase in the number of cases of meningitis in New York State since 1926, which, in view of the outbreaks in different sections of the country, has caused some concern. The Commissioner, Doctor Parran, at the suggestion of the Public Health Council, called a conference in May, 1930, in order to obtain complete information concerning the situation in various parts of the country. From the discussions and from our studies of the meningococcus strains, it is evident that, although no one strain has been recognized as responsible for any of these epidemics, from the standpoint of effective serum therapy, the relationship of the potency and valency of the

specific serum to the strain giving rise to the disease is of fundamental importance.

Strains of meningococci vary greatly in their serological and immunological reactions, the recently isolated strains often agglutinating only slightly or not at all; hence tests of the potency of the polyvalent serums with these non-agglutinable strains are often misleading—that is, fail to indicate whether or not the potency and valency of the serums are sufficiently high and broad to include these particular strains. In general, failure to agglutinate is an indication of lack of potency and valency in the serum but if the strain is in a non-agglutinable state the results may not be significant. In some instances, strains which were not agglutinated when first isolated were agglutinated later in the polyvalent serum. Not only do different strains agglutinate in widely varying degree but their antigenic action varies also when tested in the immunization of animals. The determination and study of the various strains of the meningococci are of the utmost importance in the investigation and control of epidemics and the serum therapy of the disease. Strains which are most representative of the different groups in their agglutinability and antigenic action are the strains which should be used for the production of antime-ningococcus serum that is intended for the treatment of the disease. The determination of the strains giving rise to outbreaks of the disease is important in order to be sure that the therapeutic serums possess adequate potency and valency.

The specific serum therapy of the disease is based upon the early work of Jochmann and of Flexner,^{1,2} who introduced the intraspinal injection of the serum, which proved in the extended studies of Flexner to be the effective method of specific treatment. The intraspinal method has been supplemented recently by intravenous injection of large quantities of this serum as a result chiefly of the work of Herrick, which demonstrated the importance of bacteremia, particularly in the early stages of the disease. Although undoubtedly a most valuable aid at times, treatment of the bacteremia by intravenous administration should not be so overstressed that it detracts from the more important introduction of the serum into the meninges, the real seat of the disease.

The importance of obtaining a broadly valent serum was recognized early by Flexner, Amoss, and others. Not only were representative strains of all groups of meningococci selected for the immunization of horses, but whenever a case failed to respond to serum treatment and the organism isolated from the spinal fluid failed to agglutinate in the serum, it was added to the series of cultures used in

the immunization. Thus, a broadly valent serum was assured and the reports of treatment were so favorable that it was generally adopted, not only in this country but also abroad. Unfortunately the antimeningococcus serums generally available for the treatment of cases lacked the potency and valency of the serums which Flexner used and the results of treatment with them have not been so encouraging. In many quarters the use of the serum has been practically abandoned, especially wherever there has been no improvement in potency and valency. During or toward the close of the World War, Amoss published a series of comparative tests of the different serums sold in the United States. Independently we made a series of similar tests with similar results. Our serum proved practically identical with Flexner's since the same strains and methods were used in its production, and the Flexner serum was used as a standard for the comparative testing of potency and valency. The results of these investigations were transmitted to the federal authorities and led to federal and state regulation of antimeningococcus serum, the distribution of standard cultures, and a control serum for comparative test of potency and valency. The federal standards have been advanced steadily since that time. Abroad there has been little or no effective standardization of these serums. Judging from information I was able to glean from a few personal conferences in Europe this summer, both in England and on the Continent, the results of serum therapy in meningitis have not been encouraging, to say the least.

When the laboratory first undertook the preparation and distribution of antimeningococcus serum for New York State the strains and methods of Flexner were adopted but, since many recently isolated strains failed to agglutinate and lacked antigenic activity, a thorough investigation of all the strains was made to determine which were most effective antigens and how many of them should be used in the immunization of horses to obtain serum of the highest potency and broadest valency. As a result of these investigations,^{*} published 10 years ago, it was found that both potency and valency might be increased by the proper selection of the strains and a reduction in the number to 4 or 6 of those which had proved to be the most effective antigens in the immunization of horses.

In view of the fragmentary knowledge of the virulence and pathogenicity of the various meningococci and the inadequacy of the available methods of standardization of serums in the laboratory as an indication of therapeutic potency in the treatment of cases, the change in method based upon these investigations seemed a very radical step. Accordingly, the serum was distributed to important medical centers

in order to obtain the most accurate and discriminating clinical opinion as to the therapeutic results. The reports were most encouraging and satisfactory in every particular, and it was evident that a real advance in the preparation of this serum had been made.' The reports for the past 10 years have uniformly confirmed this conclusion. Statistical comparisons of the results of the serum treatment of meningitis which have been reported in the literature have not been very satisfactory. The mortality varies greatly in different localities and in different series of cases, as well as the conditions under which they have been treated. Then, too, there has been no satisfactory standardization of the serums so that definite information concerning the tests of potency and valency of the serums used is not available.

Perhaps the most striking instance of the comparative potency of the 6-strain serum which we are now distributing is to be found in the report on a series of cases treated at the Post-Graduate Hospital in New York City by Wright, DeSanctis, and Sheplar.⁵ These came from one district in New York City and were evidently severe. The first 10 were treated with different commercial and other serums. All died. The remaining 34 received this 6-strain serum, with only 4 deaths: 2 were moribund when treated and 2 developed pneumonia. It is important to note that subsequent experience indicated that conditions relating to the character and severity of the cases had not changed, nor had the relative effectiveness of the serums which were substituted at intervals when the distribution of the 6-strain serum to the hospital was withheld. However, a much larger number of cases treated under as uniform conditions as possible is required to obtain significant comparative results.

The potency and valency of the serum used in the Flexner series and that used in ours were accurately determined by the accepted laboratory test of agglutination and in comparison with control serums, which indicated that the 6-strain serum as compared with the 20- or 60-strain serums previously used^{3,4} had a definitely higher potency and broader valency for practically all groups of the meningococci which it was practicable to study. Hence I consider most significant the comparison of 606 cases treated with this serum between 1920 and 1930, and the 1,300 reported by Flexner in 1913.⁶ In our series to date the mortality is 17.8 per cent; in Flexner's, 30.9 per cent, as compared with his estimated mortality in untreated cases of about 70 per cent. Among our 606 cases, however, there are 20 which I think should be eliminated—14 received their first dose of serum 48 hours antemortem—making the revised fatality rate 15 per cent in 586 cases.

The clinical reports, the statistical comparisons of the mortalities

in large series of cases, and the results of comparative testing in the laboratory all indicate the advance that has been made in the preparation of antimeningococcus serum.

To summarize the conclusions which are of practical interest to the health officer: Meningococcus meningitis develops as a result of contact with a case or a carrier, but only in susceptible persons. Crowding, coupled with the stress of industrial centers, or of military campaigns, is the most important condition favoring the spread of the disease in epidemic form, which is quite generally endemic the world over. In the outbreaks in this country during the past 3 years no particularly characteristic strain has been recognized as the incitant. The different strains vary widely in their virulence or toxicity, their agglutinability—especially when recently isolated—and their antigenic action as immunizing agents. In December, 1917, New York State established, and has since maintained independently, minimum standards of potency definitely in advance of those of the federal government. It is essential that the serums for specific treatment be prepared by immunization with a limited number of strains which are the most representative and most active antigenically. The minimum standards should assure the highest degrees of potency and valency. The agglutination of such serums against recently isolated strains is not a reliable criterion of therapeutic potency. Standardization by the agglutination reaction with standard strains and control serum, however, is generally quite reliable.

The serum is given intraspinaly, the dosage depending upon the amount of fluid withdrawn. It should be given slowly and at intervals of approximately 12 hours until there is definite evidence of improvement. Intravenous administration of even larger doses during the earliest stages may be helpful but should only supplement and not supplant the intraspinal treatment.

REFERENCES

1. Flexner, S. Concerning a Serum Therapy for Experimental Infection with *Diplococcus Intracellularis*, *J. Exper. Med.*, 9: 163, 1907.
2. Flexner, S., and Jobling, J. W. Serum Treatment of Epidemic Cerebrospinal Meningitis, *J. Exper. Med.*, 10: 141, 1908.
3. Wadsworth, A. B. Comparison of the Potency of Polyvalent Antimeningococcus Serum Produced with Four and Six Representative Strains and That Produced with Sixty Strains as Determined by the Agglutination Titer, *J. Exper. Med.*, 33: 107, 1921.
4. Wadsworth, A. B., and Kirkbride, M. B. Comparison of the Potency, Polyvalency, and Therapeutic Action of Antimeningococcus Serums, *Am. J. Hyg.*, 6: 507, 1926.
5. Wright, I. S., DeSanctis, A. G., and Sheplar, A. The Determination of the Value of Serum in the Treatment for Meningococcus Meningitis, *Am. J. Dis. Child.*, 38: 730, 1929.
6. Flexner, S. The Results of the Serum Treatment in Thirteen Hundred Cases of Epidemic Meningitis, *J. Exper. Med.*, 17: 553, 1913.

Control Measures Adopted for Epidemic Cerebrospinal Fever on Ships*

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EPIDEMIC cerebrospinal fever occurs with piquant irregularity. Indeed, since the outbreak of 1904–1905, this disease has been sometimes epidemic, sometimes sporadic without complete cessation. Europe, Africa, South America, Australia, and China have been harassed. In other words, the disease has been pandemic practically over the world between 1904 and 1910 with never a really quiescent period in the United States or Europe. In fact, in the United States, each winter, in one locality as another, groups of cases have occurred. There is no doubt that severe epidemics leave viable focuses which add to the continuity of the propagation of the disease. The meningococcus only survives in nature in the human being. The epidemiology is by no means as simple as it seems. The epidemiology of pneumonia has often been contrasted with that of epidemic cerebrospinal fever. Apparently, the latter only reaches epidemic proportions not so much through case contact as from chronic carriers. Constituting as they do often unsuspected and innocent participants, they become malevolent agencies in the spread of the disease usually in the vicinity of cases. The carriers generally outnumber the cases many to one; consequently their detection and control—mainly because of the fact that the meningococcus is decidedly selective in medium, infinitely sensitive to environment and technically difficult to recognize culturally—make boggy-haunted creatures of the painstaking and careful health officials. The sporadic character of many of the cases indicates a widespread resistance to the disease in the general population. This assumed resistance may be to the causative germ itself. The low case incidence is, however, laid at the door of the carrier, for it is stated, and often accepted, that the case incidence is dependent on the carrier incidence, reaching a comparatively high ratio, around 20. That this does not always hold true can be shown by the carrier incidence found aboard ships on which cerebrospinal fever had oc-

* Read before a Special Session of the Laboratory, Epidemiology, and Health Officers Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

curred in 1928 and 1929. This was exceedingly low (2.5 to 4 per cent) even in the face of the known close contact so apparent in the type of steerage. Therefore, in some outbreaks, there may be an increased susceptibility, racial or other, to the particular causative type strains, and this was probably true in the Filipino cases that occurred on ships and elsewhere. Certainly, when large numbers of people are brought together from scattered communities, the presence of a carrier may be a foregone conclusion. Of practical importance are the measures to control and culture carriers. The results have not been brilliantly conclusive even under controlled conditions as in military camps. The carrier state is conceivably one important condition for consideration. It may persist for weeks but obtaining accurate results by the accepted present-day laboratory technic is decidedly uncertain. Therefore, control measures cannot be based alone on carrier detection. In fact, the health official must assume an expectant attitude in regard to all alleged control measures.

The history of cerebrospinal fever shows periods of high incidence recurring at fairly long intervals. The Great War years, 1915-1918, could be considered an epidemic period, also 1928-1929. The future is problematical. In the period 1913-1916, the case incidence could be considered low, or our normal expectancy 2 cases per 100,000 population. In 1918, it was 6 times greater than the assumed expectancy. The present increased incidence began about 1925. The City of New York showed, in 1928, a higher mortality rate than in the previous 18 years. The City of Chicago reported similar increased incidence.

*Public Health Reports*¹ stated in summarizing the situation that "the reported incidence of meningococcus meningitis for January, 1929, represented the highest attack rate for that disease since 1918." No mention was made of the Pacific Coast states. California, as well as Oregon and Washington, reported a decided rise in number of cases in 1926. In fact, this increase was manifest in Oregon in 1925. The important thing to observe is that the increased incidence was maintained for 1927 and 1928 for reported cases, and deaths reached the maximum in 1929 and declined in 1930. Likewise, cases were continuously being reported throughout the summer months for these periods. For instance, Washington reported in 1925, 55 cases and 39 deaths; in 1926, 190 cases and 84 deaths; in 1927, 162 cases and 95 deaths; in 1928, 123 cases and 95 deaths; in 1929, 304 cases and 116 deaths; and for January to August, 1930, 136 cases and 46 deaths. Oregon reported in 1925, 86 cases and 37 deaths; in 1926, 99 cases and 65 deaths; in 1927, 89 cases and 35 deaths; in 1928, 76 cases and 36 deaths; in 1929, 64 cases and 42 deaths; and for January to Au-

gust, 1930, 17 cases and 11 deaths. Oregon's definitely high mortality rate may be explained by incomplete reporting. California reported in 1925, 97 cases and 30 deaths; in 1926, 192 cases and 91 deaths; in 1927, 222 cases and 91 deaths; in 1928, 224 cases and 93 deaths; in 1929, 737 cases and 381 deaths; and for January to August, 1930, 268 cases and 120 deaths.

The situation as to cases in steerage passengers appeared at first to be not serious, and gave little concern to health and shipping officials. The disease was practically limited to steerage passengers of one line and mainly prevalent in one nationality, the Filipino, whose individual resistance to the causative strain of organism was probably low. The two Pacific Coast ports most affected were Seattle and San Francisco. Between November, 1928, and May, 1929, there occurred among the steerage passengers on 16 ships of one transportation company en route to these ports from the Orient, 193 cases of acute cerebrospinal fever; 166 of these were Filipinos; 21 Chinese; 2 Japanese, and 4—2 of which were Chinese—members of the crew. Many of these died at sea. It was interesting to note that cases were found on 5 ships on 2 different trips. These trips approximate 60 days in length. On 3 ships there occurred a small number of cases on the first trip. On the next trip from the Orient, they were remarkably increased, reaching 43. There were no cases reported on any of the trips to the Orient from the States. Search of the crew of 2 ships for carriers on two occasions revealed a few who were promptly removed before sailing. Both ships had, however, further cases of meningitis in Filipino steerage passengers on their return from the Orient. Until such measures as laboratory search for carriers and reasonable control of contacts were fully established in the ports affected, contact cases in the general population appeared, probably as a result. Such contact cases should primarily be most prominent in resident Filipinos.

Oregon, however, reported for 1929 only 1 case and 1 death in Filipinos and that in April; Washington reported 26 cases or approximately 10 per cent of the total, and 3 deaths in Filipinos exclusive of ship cases; and in California—where data are available as to Filipino nationality only in the City and County of San Francisco, the County of San Joaquin, the County of Monterey, and the City of Sacramento—San Francisco reported, January to June, 1929, 15 cases in Filipinos exclusive of ship cases; Monterey County 33 cases; San Joaquin County 14 cases and 6 deaths; and the City of Sacramento 3 cases since the beginning of 1929. The available data would indicate that there were 65, or approximately 10 per cent of the total, possible contact cases in Filipinos in California for the above communities and

municable diseases and the technic of isolation. The ships in question have what is known as "hatch" type of steerages. Contact is, therefore, very intimate unless properly controlled, and racial characteristics of the Filipino insure that such contact under ordinary conditions is inevitable.

The following recommendations were promptly put into effect and have since been made a procedure of operation for control of any outbreak of communicable disease en route. Regulation No. 13, as to the establishment of an isolation area, proved to be of practical importance, but somewhat financially burdensome, because of loss of passenger space.

1. Careful medical inspection, including taking of temperatures, to be made at port of embarkation of all steerage passengers, and those who are sick with meningitis or undiagnosed febrile conditions, or who have presumably been in contact with cases of meningitis, should be refused embarkation. In epidemic periods, such passengers should be detained under medical supervision for 2 weeks, and if thought desirable, nasopharyngeal cultures taken for the presence of meningococci carriers.

2. En route, ships' surgeons should make a careful inspection of all steerage passengers twice daily, using the clinical thermometer to detect all cases of fever.

3. All those persons showing rise of temperature to be isolated until such time as a definite diagnosis can be made.

4. All cases of meningitis or those suspected of having meningitis should be immediately isolated and continued in isolation until arrival at suitable port of debarkation.

5. The nurse or attendant assigned to cases of meningitis should not care for persons suffering from any other disease.

6. Mess gear used by such patients should be immersed in a disinfecting solution or preferably boiled before being removed from the sick bay. Articles such as gauze, paper napkins, etc., used by the sick should be burned or thrown overboard, if at sea.

7. All general mess gear used by steerage passengers should be sterilized after each meal by immersion in actually boiling water for not less than 5 minutes.

8. Steerage compartments should be kept clean and amply ventilated. The type of ventilation and the amount of air change needed should be properly determined.

9. The captain of the ship should detail one of his officers to supervise, along with the ship's surgeon, the enforcement of the above recommendations and those that follow. The captain should hold these two officers absolutely responsible for the carrying out of these instructions.

10. So long as the situation with regard to cerebrospinal fever is acute, an additional practical or, preferably, a trained nurse should be detailed to each ship from infected ports as a special assistant to the ship's surgeon. Likewise, there should be picked out either from the steerage passengers or from the employees one man from each race to act as assistant to the chief surgeon.

11. That the hospital on the top aft deck should be set aside for the members of the crew with this proviso: that should a case of cerebrospinal fever be present it will not be quartered here as contact with the deck is entirely too prominent.

12. The hospital on the steerage deck should be retained as an isolation hospital for actual cases of cerebrospinal fever.

13. That a section of the steerage passenger quarters be set aside with its unit of wash rooms and toilets to be used as an isolation hospital for those becoming ill with symptoms not recognizable for the moment as those of cerebrospinal fever.

14. Special attendants should be arranged for those in the suspect hospital and those in the hospital proper. The food supply for these must be cooked separately and the dishes handled separately, washed thoroughly, and later boiled. These attendants must not come in contact with the other passengers. In the hospital proper and in the isolation unit there should be facilities for the cleansing and disinfecting of hands and the changing of gowns and masks before leaving cases of cerebrospinal fever. Therefore, it is necessary that the attendants, the doctors and the nurses wear suitable gowns and masks.

15. Individual glasses or paper cups should be supplied to the steerage passengers.

16. Steerage passengers should be made to sleep in opposite directions, that is, feet to head rather than head to head. In epidemic periods, unit isolation may be maintained by the use of canvas stretched between berths.

17. Sputum and vomitus cups should be supplied for each berth.

18. Ventilation should be sufficient but frequent changes must be maintained by the opening of port holes or by the non-closing of the forced draft.

19. Hot water, soap and towels, paper preferred, should be supplied to the steerage passengers every morning and at each meal time.

20. Food should be served on the plate and the passengers not allowed to dip into the general food supply. All dishes should be washed with soap and hot water and rinsed in boiling water. In times of the presence of cerebrospinal fever on board, it might be necessary to set up special hours for meals for each cook and establish specific areas for meals. Under no circumstances at the time of cases of cerebrospinal fever on board should there be allowed intermingling or any social contact as gambling, etc.

21. There should be frequent flushing of the steerage decks with soap and water. It is permissible, of course, to use a disinfectant like lysol, but the former is indicated.

22. No allowance of off-shore leave in infected ports for steerage passengers from the Philippines or members of the steerage crew. No admittance of native peddlers aboard ship.

23. There should be a supply of anti-meningitis serum, lumbar puncture needles, gowns and masks on board for the ship's surgeon and for nurses and attendants. In this connection, each ship's surgeon should receive specific instructions from the chief surgeon as to prophylaxis and control of communicable diseases. The officials of the steamship line should consider keeping their chief surgeon in touch with the ship by radio each day concerning any illness on board. Again, no physician should be employed in the future unless passed upon by the chief surgeon and after having received instructions as to the control and isolation of communicable diseases that may be encountered en route.

24. Under the existing circumstances, the presence of a case or a suspected case of cerebrospinal fever on board any ship should mean an increased and extraordinary activity to prevent its spread. To develop this end the commanding officer should lend his energy and every effort.

25. Should a case of communicable disease like cerebrospinal fever develop en route between ports like Hongkong and Honolulu arrangements should be made with the local health officer and port authorities in Honolulu that such case may be removed, thereby lessening contacts.

26. Once a case of meningitis develops en route in steerage space areas, the passengers in this area should be considered contacts and control measures instituted for the group.

27. Steerage passengers of like nationality should be placed together and, if practical, those from each port of call.

28. Steerage passengers from infected ports should not be accepted unless specific instructions to do so are issued or only when the known precautionary measures are in effect.

29. Disease conditions in ports visited should be ascertained by the ship's surgeon and the information conveyed to the chief surgeon.

REFERENCES

1. *Pub. Health Rep.*, Mar. 1, 1929.
2. *California & West. Med.*, 32: 5 (May), 1930.

Death of Dr. Charles Krumwiede

BY the death of Dr. Charles Krumwiede, Fellow A. P. H. A., for many years assistant director of the Health Department laboratories of New York City, the world of science loses an outstanding bacteriologist whose worth was recognized by scientists of every country. He had in charge the supervision of anti-toxins, serums and biological products for the use of the department or generally by practicing physicians, and he made his office an opportunity for widening medical knowledge.

Dr. Krumwiede in connection with Dr. William H. Park carried on in 1910 the experiments with bovine tuberculosis germs which confirmed the proof that they could infect human beings and thus led to the pasteurization of milk in the city and elsewhere in many countries. He devised improved methods for the isolation of the typhoid bacillus. His most recent discovery of importance was that the supposed bacillus of psittacosis, or parrot fever, was not guilty, the real culprit being an invisible filterable virus.

Dr. Krumwiede was at times an instructor in bacteriology in Bellevue and at New York University. He was an honored member of many scientific bodies. He was unknown to the general public, a fine example of the type of modest, quiet, self-effacing scientists in government employ who for little pay and with scant applause do work of immense value to their community and their time.—*The World*, New York, N. Y., Dec. 31, 1930.

Incidence and Source of Epidemic Meningitis on the Pacific Coast 1929*

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THE year 1929 was a fruitful one for epidemic meningitis, not only in certain western states but also in other parts of the United States, as well as in certain areas of the Orient.

It is not the purpose of this paper to deal with the epidemiology of the disease, but it is pertinent to point out that meningitis showed a higher rate than in any of the preceding 7 years. It was twice that of 1928, and more than 3 times that of any other year since 1925. This disease tends to occur in cycles and the large number of cases in 1929 was due to the gradual building up over a period of 5 years, as each succeeding year had shown a higher incidence than the preceding one. The crest of the epidemic wave was reached in the Pacific Coast states in 1929, but the disease continued prevalent in some adjacent states of the Rocky Mountain area until the spring of 1930 when subsidence was noted.

In addition to discussing the incidence in Pacific Coast and adjoining states, brief mention will be made of the occurrence of meningitis in the Orient and on ships having regular commercial relations between those ports and Pacific Coast ports in the United States. The latter is worthy of consideration as a possible factor in contributing to an increase in the number of cases, particularly in California and Washington.

MENINGITIS IN PACIFIC COAST STATES

There was a serious outbreak of epidemic meningitis in two Pacific Coast and two adjoining states. It is thought that during 1929 there were more cases and deaths from this disease in California than in any preceding year for a long period. There were 260 cases with 101 deaths in 1927, and 259 cases with 115 deaths in 1928. Both of these years showed an increase over preceding ones. The year 1929 showed

* Read before the Western Branch of the American Public Health Association at the First Annual Meeting in Salt Lake City, Utah, June 13, 1930.

the marked rise to 695 cases with 381 deaths. The majority of these occurred in the first half of the year, and from January 1 to August 31 there were 302 deaths distributed according to nationality as follows: Filipinos, 57; Mexicans, 39; Chinese, 16; Japanese, 6; giving 118 Orientals out of the total. According to sex, 218 were males and 84 were females.

The disease has shown a decline in the first quarter of 1930. There were 318 cases from January 1 to April 26, in 1929, against 185 cases for the corresponding period in 1930. Although it occurred in all parts of the state, there were definite sections where undue prevalence existed. The 5 principal ones were: Los Angeles County, 161 cases; San Francisco, 88 cases; Sacramento County, 71 cases; Monterey County, 63 cases; and San Joaquin County, 16 cases. In Los Angeles County the sufferers were whites and Mexicans; in Monterey County the majority were Filipinos employed in canneries or lettuce fields. Of 31 cases reported between January 1 and May 1, there were Filipinos, 19; Mexicans, 4; Japanese, 2; whites, 8. The first case was in a white person, one month before the first Filipino patient was reported. In Sacramento and San Joaquin Counties, a considerable number of the cases were Filipinos.

In San Francisco during the calendar year 1928, there were 37 cases: 35 whites and 2 Chinese. In 1929 there were 88 cases: 65 whites, 17 Filipinos and 6 Chinese. There were no cases among the Japanese. During the first quarter of 1929 there were 48 cases. For the same period in 1930 there were 15, all whites except one Filipino. It will be noted that the number of cases among the Filipinos in 1929 was large in proportion to their number.

The non-local cases developing and treated in San Francisco are not included, as they are not properly chargeable against that city.

The State of Washington showed an increase over 1928, the crest being reached in 1929. This state, like California, has active commercial relations with the Orient, and a number of vessels arrived at Seattle with meningitis among the Filipino steerage passengers. Exclusive of ship cases there were reported 221 cases and 70 deaths in 1929, the highest number for any recent year. The following nationalities were affected: whites, 178; Filipinos, 28; Japanese, 12; Chinese, 3. The cases resulting from infection on shipboard were 83, with 18 deaths: 78 Filipinos, 4 Chinese, and 1 Japanese.

Oregon did not show an increase in 1929 over preceding years; in fact the disease was less than in 1927 and 1928. In 1926 there were 99 cases; in 1927, 89; 1928, 76; and in 1929, 64. There has been a further diminution in cases in 1930. From January to April, 1929,

there were 31 cases; for the first 4 months in 1930, 11 cases. In 1929 all the cases were whites except 1 Filipino. There are few of the latter in Oregon outside of a settlement in Portland, which does not seem to have suffered from the disease to any degree.

INCIDENCE OF THE DISEASE IN ADJOINING STATES

For comparative purposes the incidence in states adjoining those of the Pacific Coast is of interest. In all of these the number of Filipinos is negligible, very few being domiciled therein. Two of these states had a severe outbreak of meningitis in 1929, a larger number of cases in proportion to population than in either California or Washington, where stress has been laid on the Filipino.

In Arizona there were 76 cases in 1928 and a marked rise in 1929 to 287. For the first quarter of 1929 there were 172 cases and for the same period in 1930, 115. While a diminution has occurred it is less than in other sections under consideration. In this state the records do not show the nationality of those affected, but the State Health Officer advises that there are not large numbers of Filipinos and there has not been any prevalence of meningitis among them.

Idaho had 99 cases of meningitis in 1928, and an increase in 1929 to 256. This incidence is high in comparison to population, and the outbreak must be considered severe. It is estimated that not over 10 per cent of the cases were foreigners. There are practically no Filipinos in the state and there was no meningitis among them.

Nevada had little meningitis in 1929, in fact probably not more than could be considered normal. During 1928 there were 17 cases and in 1929, 21. There are few Filipinos and no case of meningitis occurred in this nationality. The disease for the first quarter of 1930 shows no variation from that of the same period in 1929.

MENINGITIS AMONG STEERAGE PASSENGERS ON VESSELS FROM THE ORIENT

A review of the cases of meningitis occurring on vessels from Manila and Chinese ports in 1929 and the years immediately preceding is of interest in showing that the Orient was subject to the same cyclical increase that occurred in the United States. The incidence in the Orient cannot be computed, and the occurrence among passengers embarked at those ports must be considered in substantiation of the opinion advanced.

A study of the cases occurring at the Immigration Station at San Francisco, where Chinese and Japanese passengers are detained, indicates the prevalence of meningitis in Chinese areas, and there is evi-

dence that a severe outbreak occurred in Shanghai. It is believed, however, that Hong Kong was the source in this particular instance, as few steerage passengers are brought from Shanghai and none were embarked at that port during the height of the epidemic. No cases originated at the Immigration Station during the fiscal years 1925 to 1928 inclusive. With the increase of meningitis in the fall of 1928 a different story unfolds, as there were 9 cases at this station in 1929, all Chinese.

The incidence of meningitis among the steerage passengers on vessels arriving at San Francisco from the Orient is as follows: 1925, 0; 1926, 1; 1927, 2; 1928, 1; 1929, 14. A further consideration of vessels having had or having meningitis among their personnel in 1929 seems warranted in order to show any relation that might exist between that infection and the occurrence of cases on the Pacific Coast. The first ship in this category arrived on October 3, 1928, and from that date to May 29, 1929, there were 14 vessels with a total of 126 cases of meningitis. Space will not permit of an analysis of these cases, but as the vessel that arrived on March 20, 1929, furnishes an excellent example of the effects of overcrowding and failure to isolate cases promptly, further consideration of it is justifiable.

There were reported 21 cases of meningitis with 4 deaths en route, all Filipinos, except 1 white seaman. Upon arrival there were 13 cases in the ship's hospital and during inspection at quarantine 6 additional cases were found. There were 27 cases among 581 Filipinos from Manila, but none among 171 Chinese from Hong Kong. The first cases occurred on the 10th day from Manila, and the others as follows: March 3, 1; March 8, 1; March 9, 2; March 11, 1; March 14, 6; March 15, 2; March 17, 4; March 18, 2; March 19, 2; March 20, 6. The last were detected at quarantine inspection. This vessel was crowded with steerage passengers; there were 647 when leaving Manila; 708 when leaving Hong Kong, and 448 upon arrival at San Francisco. During 10 days' detention of passengers at the Quarantine Station 11 cases of meningitis developed and 2 among them after discharge, a total of 40. Advises state that 20 cases developed among the Filipinos landed and detained at Honolulu, making approximately 60 cases among the 647 Filipino steerage passengers brought by this vessel.

Two other vessels arrived with high incidence of infection; one had 27 cases: 22 Filipinos and 5 Chinese; the other, 25 cases with 12 deaths: 21 Filipinos and 4 Chinese. Twenty-two of these occurred in adjoining compartments.

After May 29, 1929, no other vessels arrived having had menin-

gitis until December of that year. Chargeable against 1930 there have been only 4 vessels with a total of 8 cases of meningitis: 3 arrivals at San Francisco and 1 at Seattle.

SUMMARY OF REPORTED CASES OF EPIDEMIC MENINGITIS AMONG STEERAGE PASSENGERS ON VESSELS ARRIVING AT SAN FRANCISCO FROM OCT. 3, 1928, TO MAY, 1929

<i>Race</i>	<i>Cases</i>	<i>Deaths</i>
Filipinos	99	19
Chinese	22	9
Japanese	1	0
White	4	2
Total	126	30

The number of deaths may not be accurate, and is probably nearer 50 per cent.

The 126 cases occurred on 14 vessels, and if we assume that each carried an average number of 600 steerage passengers, we have this large number of cases in an approximate population of 8,400. When comparison is made with San Francisco, the effects of crowding and contact infection are astounding. For example, there were 73 cases in San Francisco, in a population of 625,000, during the period that 126 cases occurred on vessels with an approximate population of 8,400.

DISCUSSION

The history of meningitis on some vessels indicated Manila was the source of infection, and in others Hong Kong. The infection was introduced by embarkation of carriers or mild cases, and secondary cases developed from contact. Under conditions existing in the steerage, which was crowded, with free communication between compartments, it is no surprise that meningitis spread. The steerage passengers were bunked in close apposition to each other and there was every opportunity for the exchange of nose and throat infections. Under these conditions, meningitis has proved a dangerous contagious disease.

Cultures from 3,287 contacts gave 85 carriers. Ninety per cent of the carriers became negative in 7 days, and all in 14 days except 1 who was positive for 6 weeks.

During detention in quarantine there developed 11 cases and 2 after 10 days' detention.

RELATION OF MENINGITIS ON VESSELS TO THE INCIDENCE OF THE DISEASE IN PACIFIC COAST STATES

I believe that the high incidence of meningitis in the Pacific Coast and adjoining states was independent of the prevalence of the disease in the Orient and the infection on arriving vessels. It was a cumula-

tive effect from preceding years, as occurs in the cyclical development of outbreaks of meningitis. In various parts of the United States and other countries 1929 was a meningitis year.

It has been shown that Filipinos played no part in serious outbreaks in 2 adjoining states. No case was reported among the Filipinos in San Francisco during 1928, and it was not until February, 1929, that cases of meningitis commenced to appear among them.

Although the arrivals of Filipinos and Chinese from infected ports and on ships with the disease on board cannot be held responsible for the outbreak of meningitis in Pacific Coast states, such arrivals in large numbers might have been a contributing factor in adding to the number of cases in specific areas where they concentrated. The Filipino appears susceptible to the disease and no doubt some carriers were landed before the quarantine regulations were enforced, and probably after. These people crowd together in boarding houses or small flats for economic reasons, and consequently favorable conditions are created for the development of the disease among them.

Fifty Years of Applied Bacteriology

APPROXIMATELY half a century ago medical science enjoyed an unparalleled advance as a result of the introduction of practical laboratory methods in the study of bacteria. There are still with us a few of the pioneers of that remarkable era, notably our dearly beloved Welch. But for the medical profession at large the epoch-making work of the late 70's and early 80's is fast becoming a matter of history.

Impressed by the importance of preserving what concrete relics of this interesting period can still be rescued from obscurity, the writer suggests the advisability of organizing an exhibit to commemorate "Fifty Years of Applied Bacteriology," collecting for this purpose whatever interesting historical material may be hidden away, dust covered and forgotten, in some of the older bacteriological laboratories. Apparatus long since discarded as obsolete, old microscopes, microtomes, glass plates and levelling stands, roll cultures, illustrations of alleged disease germs, old text books, original publications of historic interest, reproductions of early culture flasks, these and many other articles may still be available. Fifty years hence much of this valuable historical material will have been lost forever.

What group interested in the history of medicine will act on this suggestion before it is too late?—C. F. B., *Weekly Bull.*, New York, N. Y., Dec. 27, 1930.

White House Conference on Child Health and Protection

Preliminary Program of

Final Session

SECTION I—MEDICAL SERVICE

February 19, 20, 21, 1931

Washington, D. C.

Samuel Mc C. Hamill, M.D., Chairman

Committee A—Growth and Development, Kenneth D. Blackfan, M.D., Chairman, Professor of Pediatrics, Harvard University Medical School.

Committee B—Prenatal and Maternal Care, Fred Lyman Adair, M.D., Chairman, Professor of Obstetrics and Gynecology, University of Chicago.

Committee C—Medical Care for Children, Philip Van Ingen, M.D., Chairman, Clinical Professor, Diseases of Children, Columbia University College of Physicians and Surgeons.

Thursday, February 19, 1931

9:00 A.M. Opening Session for All Committees

Address of Welcome—Ray Lyman Wilbur, M.D., Chairman of the Conference

Committee A—Growth and Development

Thursday

9:30–11:00 A.M.

General Considerations—Edwin Bidwell Wilson, Ph.D., Professor of Vital Statistics, Harvard School of Public Health

Thursday

11:00 A.M.–1:00 P.M.

Anatomical Considerations—Richard E. Scammon, Ph.D., Professor of Anatomy, University of Chicago

Thursday

2:30–4:30 P.M.

Physiological Considerations—A. J. Carlson, M.D., Sc.D., Professor of Physiology, University of Chicago

Thursday

8:00 P.M. (See Program of Committee C—Medical Care for Children)

Friday, February 20, 1931

9:30 A.M. (See Program of Committee B—Prenatal and Maternal Care)
(See Program of Committee C—Medical Care for Children)

Friday

2:00–3:30 P.M.

Appraisal of the Child

1. Physical Status—T. Wingate Todd, M.B., F.R.C.S., Professor of Anatomy, Western Reserve University School of Medicine

Friday

3:30-5:00 P.M.

Appraisal of the Child

2. Mental Status—Douglas A. Thom, M.D., Director, Division for Mental Hygiene, Massachusetts Department of Mental Diseases

Friday

8:00 P.M.

Nutrition—Lafayette B. Mendel, Ph.D., Sc.D., Professor of Physiological Chemistry, Yale University

Committee B—Prenatal and Maternal Care

Thursday, February 19, 1931

9:30-11:30 A.M.

Prenatal, Maternal and Early Infant Care—John Osborn Polak, M.D., Professor of Obstetrics and Gynecology, Long Island College Hospital School of Medicine

Thursday

11:30 A.M.-12:30 P.M.

Interested Organizations—Robert D. Mussey, M.D., Professor of Obstetrics University of Minnesota (Mayo Foundation)

Thursday

2:00-5:30 P.M.

Factors and Causes of Fetal, Early Infant and Maternal Morbidity and Mortality—Hugo Ehrenfest, M.D., Assistant Professor of Obstetrics and Gynecology, Washington University Medical School

Thursday

8:00 P.M. (See Program of Committee C—Medical Care for Children)

Friday, February 20, 1931

9:00-10:15 A.M.

Obstetric Teaching and Education of Midwives—James Robert McCord, M.D., Professor of Obstetrics and Gynecology, Emory University

Friday

10:15-11:30 A.M.

Obstetric Teaching and Education of Nurses and Nursing Attendants—George W. Kosmak, M.D., Editor, American Journal of Obstetrics and Gynecology

Friday

11:30 A.M.-12:30 P.M.

Teaching and Education of the Laity and Social Workers—Robert L. De-Normandie, M.D., Instructor in Obstetrics, Harvard University Medical School

Friday

9:00 A.M.-12:30 P.M.

Basic Sciences and Their Relation to Maternal and Fetal Problems—Leslie B. Arey, Ph.D.

Friday

2:00-5:30 P.M.

Obstetric Teaching and Education of Physicians

1. Correlation of Instruction in the Basic Sciences with that in Obstetrics from:

- a. Viewpoint of Basic Sciences—Leslie B. Arey, Ph.D., Professor of Anatomy, Northwestern University Medical School
- b. Viewpoint of Obstetrics—J. M. H. Rowland, M.D., Professor of Obstetrics, University of Maryland School of Medicine
2. Undergraduate Education—Palmer Findley, M.D., President Central Association of Obstetrics and Gynecology
3. Graduate Education—Rudolph W. Holmes, M.D., Associate Professor of Obstetrics, Northwestern University Medical School
4. Education and other Obstetric Requirements for Granting Degree of Doctor of Medicine, Licensing to Practice, and for Specialization—Walter T. Dannreuther, M.D., Professor of Gynecology, New York Post-Graduate Medical School

Friday

8:00 P.M. (See Program of Committee A—Growth and Development)

Committee C—Medical Care for Children

Thursday, February 19, 1931

9:30 A.M.—1:00 P.M.

Convalescent Care—Adrian V. S. Lambert, M.D., Chairman, Executive Committee on Convalescence, Welfare Council of New York, N. Y.

Foster Homes for Convalescence—Ida M. Cannon, R.N., Chief of Social Service, Massachusetts General Hospital

Thursday

9:30 A.M.—1:00 P.M.

Psychiatry and Psychology—Bronson Crothers, M.D., Assistant Professor of Pediatrics, Harvard University Medical School, Neurologist to Children's Hospital, Boston, Mass.

Thursday

9:30 A.M.—1:00 P.M.

Orthopedics and Body Mechanics—Robert Bayley Osgood, M.D., Professor of Orthopedic Surgery, Harvard University Medical School

Thursday

9:30 A.M.—1:00 P.M.

Nursing—Stella Goostray, R.N., Secretary, National League of Nursing Education, Superintendent, School of Nursing, Children's Hospital, Boston

Thursday

2:30–5:00 P.M.

Hospitals and Dispensaries—Clifford G. Grulee, M.D., Clinical Professor of Pediatrics, Rush Medical College (Lantern Slides)

Thursday

8:00 P.M.

Preventive Measures—Philip Van Ingen, M.D., Chairman of the Committee
Report on a National Survey to Determine the Extent to which Preventive Medical and Dental Services Reach Preschool Children—George T. Palmer, Dr.P.H., Director of Research, American Child Health Association (Lantern Slides)

1. In 158 cities based upon approximately 85,000 families interviewed. Relative standing of states in proportion of preschool children having had health examinations, dental health examinations, vaccination against smallpox and diphtheria immunization. Influence of economic status and age.

2. In rural areas in 42 states based upon approximately 25,000 families interviewed. Relative standing of states in proportion of preschool children reached. Variations at different age levels. Geographic differences in hospital and home delivery service and attendance at birth. Accessibility of medical, dental and hospital service.

Conclusions and Recommendations—Samuel McC. Hamill, M.D., Chairman of the Section

Friday, February 20, 1931

9:30 A.M.—12:30 P.M.

Pediatric Education—Borden S. Veeder, M.D., Professor of Clinical Pediatrics, Washington University School of Medicine (Lantern Slides)

Friday

2:15–5:00 P.M.

Medical Social Service—Ida M. Cannon, R.N., Chief of Social Service, Massachusetts General Hospital

Friday

2:15–5:00 P.M.

Health Centers—J. H. Mason Knox, Jr., M.D., Chief, Bureau of Child Hygiene, State of Maryland Department of Health; and Mrs. Berthold Strauss, Vice-President, Community Health Center, Philadelphia, Pa.

Relation of the Nutritionist to the Health Program—Lucy H. Gillett, M.A., Superintendent, Nutrition Bureau Association for Improving the Condition of the Poor

Friday

2:15–5:00 P.M.

Dentistry and Oral Hygiene—Percy R. Howe, D.D.S., D.Sc.

Friday

8:00 P.M. (See Program of Committee A—Growth and Development)

Saturday, February 21, 1931

9:30 A.M. Joint Session for All Committees

Summaries of Findings and Recommendations of the Committees

1. Committee A—Growth and Development—Kenneth D. Blackfan, M.D., Chairman of the Committee
2. Committee B—Prenatal and Maternal Care—Fred Lyman Adair, M.D., Chairman of the Committee
3. Committee C—Medical Care for Children—Philip Van Ingen, M.D., Chairman of the Committee

The Discovery of *Trichina Spiralis*

THE recent outbreak of trichinosis in Stuttgart has kindled interest in a disease epidemics of which are uncommon in this country. The story of the discovery of the parasite¹ is obscured by priority claims which lack historical perspective. Even the new edition of Osler's *Principles and Practice*—a textbook famed for its historical atmosphere—gives a regrettably incomplete account of the history of trichinosis, with no mention of Paget's name.

The main events in the story may briefly be summarized. F. Tiedemann in 1822 was the first to describe "white stony concretions" in human muscle (analyzed by L. Gmelin), though he never suspected their parasitic origin. In 1833 John Hilton described minute cysticerci in which microscopically he was unable to detect any organization. On February 2, 1835, at St. Bartholomew's Hospital, James Paget was dissecting the muscles of a subject when his scalpel became quickly and repeatedly blunt. Other students had attributed their similar experience to the presence in the muscles of "spicula of bone," and Wormald, the senior demonstrator of anatomy, had seen at least 20 bodies studded with whitish specks. Paget, however, was the first to suspect their animal nature, which he confirmed with the aid of Robert Browne's simple microscope—for St. Bartholomew's did not even possess a dissecting lens. He made careful sketches of the worm, preserved in the library of the Royal College of Surgeons of England, and lectured on his discovery to the Abernethian Society of St. Bartholomew's Hospital, on February 6. On Stanley's suggestion he wrote an account of his work for the *London Medical Gazette*. This was never published, but the manuscript may be seen at the College of Surgeons.

A specimen of infected muscle was sent to Richard Owen, who established the nematoid nature of the worm, named it *Trichina spiralis*, and, taking the credit for its discovery, earned the applause of his professional brethren. Paget's behavior in this melancholy episode was admirable. His original specimen was deposited in St. Bartholomew's Hospital museum. Fifty years later it was thrown away, as time had reduced it to dust and ashes.

The life history of the trichina was fully worked out by Herbst, Virchow, Zenker, and Kuhne, who completed a discovery made by a medical student of twenty-one years.—*Brit. M. J.*, Oct. 11, 1930, p. 610.

This statement omits entirely any reference to the most significant discovery among those of the many investigators who contributed to working out the life history. It was the demonstration of a similar encysted stage in the pig. For this the distinguished American physician and investigator Dr. Joseph Leidy of Philadelphia was responsible. The older authors overlooked the leading part he played in laying the foundations of parasitology, perhaps by virtue of his outstanding contributions in other fields. This oversight was adequately corrected by numerous addresses delivered on the occasion of the Leidy centenary in Philadelphia during September, 1923.

Leidy's part in the elucidation of the life history of trichina was one of the most significant contributions to research, giving the key to unlock the story of the life cycle of this parasite and at the same time furnishing the foundation for a simple and effective method for the prevention of the disease.

In 1846 Leidy recorded the discovery of minute encysted worms in the hog. He wrote that he "could perceive no distinction between it and specimens of *Trichina spiralis* which he had met with in several human subjects."²

REFERENCE

1. Fully told in *St. Bartholomew's Hosp. J.*, XXXVI: 39-42, 1928.
2. *J. A. M. A.*, Dec. 27, 1930, p. 1988.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whom name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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CONTROL OF MENINGOCOCCUS MENINGITIS

THE incidence of meningococcus meningitis has been rising steadily through the last five years¹ and has been accompanied by local epidemics of some severity and with high fatality rates. The number of carriers has also been higher than in former reports. Flack² found 2 per cent of the community and 8 per cent of the contacts to be carriers, whereas in a recent epidemic in Detroit 6 per cent of unexposed members of the community and 46 per cent of contacts were found to be carriers. Segregation of carriers is usually considered impracticable.³ When untreated the carrier stage has been found to persist on the average for 4½ weeks in contact carriers, and for 3½ weeks in carriers who are not known to have been contacts.⁴

Thirteen years ago Simon Flexner⁵ emphasized the importance of treating carriers as a potential source of future cases and recommended the method of Dunham and Dakin⁶—the use of an oil spray of dichloramine T. He stated that artificial immunization through inoculation of killed cultures “has failed completely.”

Since that time no constructive suggestions of serious importance have been offered, although the subject has been frequently discussed. The revival of the method of inoculation with apparent success is therefore worthy of some attention.

In the winter of 1927, Dr. Manoussakis found himself confronted with an epidemic in the cavalry barracks at Athens.⁷ Of 150 contacts 70 per cent were found to be carriers. He prepared a vaccine by cul-

ture from the puncture fluid of the original case. The vaccine was killed by heat at 56° C. for 30 minutes and administered in 2 doses of 2 and 3 milliards respectively at an interval of 7 days. The number of carriers among the contacts was quite promptly reduced to 2 per cent and the threatened epidemic was averted.

The same method was used during 2 threatened epidemics in the winter of 1929 and in one instance during the present year (1930). In discussing his apparent success on each of these occasions Dr. Manoussakis emphasizes: (1) that the vaccine was freshly prepared, and (2) that the strain employed was absolutely specific. In view of the known variety of strains and of the recent recognition of an organism hitherto undescribed, the latter point is evidently significant.

REFERENCES

1. Williams, R. C. The Prevalence and Trend of Meningococcus Meningitis in the United States, *Pub. Health Rep.*, 45: 1657 (July 18), 1930.
2. Flack, M. Med. Research Council. *Spec. Rep. Ser. No. 3*, 1917.
3. e.g., Mink. *Epidemiology and Public Health*, 1: 577, 1922.
4. Flexner, Simon. Mode of Infection, Means of Prevention, and Specific Treatment of Meningitis, *J. A. M. A.*, 69: 639, 721 (Aug. 25, Sept. 1), 1917.
5. *Brit. M. J.*, 1: 682, 1917.
6. Manoussakis, M. E. L'Autovaccination antiméningococcique en période épidémique, *Bull. Acad. de Méd., Paris*, 104: 155 (Aug. 4), 1930.
7. Branham, Sara E. *Pub. Health Rep.*, Apr. 18, 1930.

MR. CALVER RESIGNS AS EXECUTIVE SECRETARY

HOMER N. CALVER resigned on December 31 as Executive Secretary of the American Public Health Association, after seven and one-half years' service. This announcement will be received by all the friends of the Association with regret.

The Executive Board accepted Mr. Calver's resignation with reluctance upon his request for release from his obligations, and in so doing, spread the following resolution on its minutes in behalf of the Association:

RESOLVED, that during the term of his office, Homer N. Calver as Executive Secretary of the American Public Health Association has put the interests of the Association before all others, has been loyal to his responsibilities, energetic and resourceful in carrying out the intent and directions of the officers and members, patient and equable in the presence of conflicting opinion, and counsel, systematic and thorough in making effective the changes in plan and scope of the work and organization of the Association, twice radically altered during his term of office, scrupulously careful in all matters of income and expenditures of the Association, and at all times consistently upholding high professional standards for the public health profession in dealing with commercial and business interests in the conduct of his office.

Every member of the Association and every reader of its *Journal*, no matter how casual his observation of the affairs of the Association

may have been, cannot fail to be struck with the growth and development of the organization during Mr. Calver's competent administration. Some comparisons between situations in July, 1923, when Mr. Calver took office, and now, may be interesting.

When he took office, the Association had about 2,600 members. It now has 4,300 members, not including an additional 2,500 members in the affiliated state societies.

The number of these societies has grown from 3 to 15. The relationships of the societies to the parent organization have been clarified and strengthened.

To the Annual Meetings of the Association Mr. Calver has made a contribution that cannot be overestimated. He has devoted himself with great zeal to their organization and has developed a most efficient technic for their management and operation. Through his efforts and vision, excellent programs have been built up, the range of subject matter has become infinitely wider, and the standards of papers notice-



HOMER N. CALVER

ably raised. The Annual Meetings have become distinguished alike for scientific pronouncements and attendance. This definite rise in quality attracts increasingly large audiences of Fellows and members. The attendance at the Boston meeting in 1923 was 904. The following years show steady gains, reaching the high-water mark of 2,577 in Chicago in 1928. In 1929 and 1930 registrations were about 1,400 and it is safe to prophesy that this figure, representing a gain in attendance of 500 or more, will be reached for several years to come. At Mr. Calver's urging, the Association has determined to finance Annual Meetings from the sale of exhibit space instead of taxing the hostess city, as in the past. Income from exhibits has increased from \$1,950 in 1922 to \$22,000 in 1928 and to \$17,500 in 1929.

The place of the sanitarian in public health has been memorialized through the establishment of the Sedgwick Memorial Medal, which has been to a considerable extent brought about through the efforts of Mr. Calver.

The American Journal of Public Health, of which Mr. Calver was

editor for five years, and the supervision of which has been his responsibility throughout, has increased its circulation from some 3,700 copies per month to over 6,500 copies. Recently the purchase of *Nation's Health* was negotiated and it was combined with the *Journal* so that the publication now stands alone in this field.

The excess of all assets of the Association over liabilities at the time when Mr. Calver assumed direction of the Association was about \$3,500. With careful husbanding this has grown to a net wealth of nearly \$28,000. For the fiscal year 1923, the income from all sources except grants for special purposes was in the neighborhood of \$40,000. This year the comparable income is \$123,000. These figures are significant because this income, which must be earned largely through self-supporting activities, has increased without a corresponding increase in the dues of members. Although these figures may seem small in these days of million dollar enterprises, their importance in terms of progress of the Association are most significant. Of even greater value are the many constructive changes in administration which have been brought about, giving stability of organization and clarity of function to the increasingly numerous elements of the Association.

These activities, which are casually accepted and taken for granted by the members of the American Public Health Association, have attracted the attention of those who view general public health development, and as an indication of their significance in the field of public health promotion, the Ling Medal for distinguished service in behalf of health and child welfare was presented to Mr. Calver as Executive Secretary of the Association at the Fifty-ninth Annual Meeting in Fort Worth.

In seven and one-half years Mr. Calver has inscribed a record on the scrolls of the Association that will challenge his successor.

It is the sincere belief of those who have worked with Mr. Calver, and in doing so have had the opportunity to know his talents and his fitnesses, that he goes on to bigger and better things. He takes with him the good will and firm friendship of the members of the Association to which he has made such a splendid contribution.

BARBER SHOPS AND BARBERING

ALMOST everyone, male and female alike, now patronizes barbers. Even those women who frequent the beauty parlors go to barbers to have their hair trimmed.

In view of this, a report recently made by the Commissioner of

Public Health of Massachusetts' will be of interest to our readers. The Legislature of Massachusetts ordered an investigation of barbers and barbering, which was done partly through a questionnaire, to which 1,675 doctors responded. Only 16.3 per cent of the physicians had ever seen cases of diseases attributable to barber shops, but these reported 654 cases, 58 per cent of which were pustular skin infections, 35 per cent not classified, and 7 per cent described as nits, ringworm and syphilis. Thirty-four per cent of these cases were reported by 5 physicians, and the Commissioner has rightly questioned the diagnosis, at least as far as syphilis goes.

The newspapers took an interest in the investigation, and at their request, two public hearings were held at which 40 persons in a population of more than $4\frac{1}{4}$ million reported their conviction that they had been infected in barber shops; but of these, only 20 could be located, in 3 of which the claim seemed reasonable.

Inspection showed that of 2,439 shops in different sized communities, 34.5 per cent were in good condition, 18.4 per cent bad, while 46.6 per cent were mediocre. In general, the sanitary and esthetic conditions were proportionate to the prices charged by the shop.

The conclusions reached were that while there was room for improvement in the sanitary conditions of shops generally, only a negligible amount of skin infection could be traced to them, and there seemed to be no evidence indicating that further legislation regarding licensing, regulating, or inspecting of barber shops was needed at this time in Massachusetts.

The result of these studies, which have been carefully carried out, will be comforting to all who patronize barbers, assuming that Massachusetts represents fairly the rest of the country. The small number of skin infections reported, especially those due to lice and ringworm, is somewhat surprising. Certainly barbers come in contact with the great proportion of the population. In shaving, the external layers of the skin are frequently broken. Brushes and combs are used on hundreds of heads, often with imperfect or no washing or sterilization in between. The same shaving brush is used on many faces, but the necessities of the case require at least washing, which is generally done in hot water. The average barber is fond of blowing away the clipped hair, which furnishes abundant opportunity for droplet infection, and no barber discontinues his job on account of ordinary colds and sore throats. Like all places frequented by numbers of people, they afford opportunity for the spread of infection.

REFERENCE

1. *New England J. Med.*, Jan. 9, 1930, pp. 89-90.

ASSOCIATION NEWS

DR. WALKER ACTING EXECUTIVE SECRETARY OF THE A. P. H. A.

Due to the resignation of Homer N Calver, as of January 1, 1931, W. Frank Walker, Dr.P.H., Secretary of the Committee on Administrative Practice, will serve as Acting Executive Secretary of the Association.

NEW SECRETARY FOR THE COMMITTEE ON FELLOWSHIP AND MEMBERSHIP

Cornelia Lyne, who has been Secretary of the Committee for the past year, has resigned to take a position as head of the Membership Department of the National Child Labor Committee of New York City. Marie L. Rose, formerly of the American Child Health Association, will succeed her, beginning January 15.

LABORATORY SECTION

Beginning with this issue, John F. Norton, Ph.D., takes over the preparation of the Laboratory Notes Section of the Journal, succeeding C. C. Young, D.P.H., whose many duties have made it impossible for him to continue to contribute to this department.

ACKNOWLEDGMENT

The following members of the Association sent in paid applications for new members during the 4-weeks membership drive:

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A. F. Richards, M.D., Sparta, Tenn., Asso-
ciate Director, Local Organization

DEATH OF DR. HASTINGS

CHARLES J. HASTINGS, M.D.,
Medical Officer of Health, Toronto,
Ont., died on January 17. He has been
a member of the American Public Health

Association since 1911, a Fellow since
1922, and was elected to Honorary Fel-
lowship in 1926. He was President of
the Association in 1918.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Administrative Record Forms—

The Committee on Administrative Practice has recently issued an Administrative Cumulative Monthly Record Form which is based upon the *Appraisal Form*, which aims to give each month a picture of the quantity of service rendered in each of the various activities into which the *Appraisal Form* has been divided. Thus, under communicable disease control there are entries for the number of field visits by professional personnel for each of the more important reportable diseases. The number of cases hospitalized, and the number of children or adults immunized against certain diseases may also be entered on the form. For tuberculosis, there is provision for a record of all new cases admitted to the clinic, the number of contacts examined, the number of visits made in behalf of cases by field nurses, and the number of cases hospitalized, together with several other items.

In the same manner, closely adhering to the outline of the *Appraisal Form*, provision is made for a brief statement of vital statistics, care of the child including the school health service, food and milk, sanitation, laboratory, and popular health instruction. There are also additional forms covering cancer and heart disease control. Provision is also made for a summary which affords a comparison over a period of 4 years. The tables permit of extension and may be fitted to local needs. These record cards have been designed to keep the health administrator intimately informed as to progress being made by his department during the course of the year, and the cumulative record is designed pri-

marily as an aid in the preparation of the annual appraisal of health activities.

In 1927 the Committee on Administrative Practice issued its first record forms. There were four sets submitted at that time including forms for communicable disease service, laboratory, school health service, and public health nursing. In 1928, with the coöperation of the National Tuberculosis Association, tuberculosis record forms were developed, and in 1929, with the aid of the American Social Hygiene Association, forms were developed for venereal disease clinic service. The latest contribution of the committee may be had by addressing the Association headquarters.

Health Service in Alameda County

—In the spring of 1930, a survey was conducted of Alameda County, Calif., by an officer of the U. S. Public Health Service, to determine the quantity and quality of health work being performed, special attention being given to those agents supported by public funds and devoting their effort to public health or the care of the ambulatory sick.

Alameda County, with a population of 440,200, is located on the eastern shore of San Francisco Bay, and 91.4 per cent of the population is classed as urban, the principal cities being Oakland, Berkeley, and Alameda. One dollar and six cents per capita is being spent for public health work. According to the *Appraisal Form*, Oakland receives a rating of 629 points, Berkeley 752, and Alameda 638 points.

It is recommended that there be created a county health department to be

under the direction of a trained medical health officer of demonstrated ability, on a full-time basis, and that the county health department have administrative control of all public health services, preventive clinics, and field activities in the area served by such county health department. It is further recommended that a beginning be made by an expenditure of \$1.00 per capita for the included areas.—Joseph W. Mountin, Health and Hospital Services in Alameda County, Calif., Alameda County Tuberculosis Association, 1930.

Organized Health Service for Endicott Johnson Company—Beginning in 1916, with 1 full-time physician and 1 nurse, the Endicott Johnson Corporation of Binghamton, N. Y., has gradually extended its health and medical service until in 1928 nearly \$900,000 a year was being expended for the maintenance of three medical centers with hospital service, first aid stations, and various clinics. There are now over 100 employees including 28 physicians, 4 dentists, 5 dental hygienists, 67 trained nurses, and 4 bacteriologists. In the year 1928, \$161,000 was paid to full-time medical members of the staff, and \$39,000 to private practitioners engaged on a fee basis. The cost per individual, to whom the service was potentially available, was \$21.81 per annum, and the cost per individual in families which actually used the service was \$25.49 per annum. A survey made to compare the degree to which medical service was being used by the employees of the organization as compared with 100 families in the general population of the neighboring com-

munities shows that employees are not only visiting physicians more frequently, but earlier in the course of a given illness.—Niles Carpenter, Medical Care for Fifteen Thousand Workers and Their Families, *Publication No. 5*, Committee on Cost of Medical Care.

Milk-borne Outbreaks—Exclusive of New York City, it is estimated that about 80 per cent of the milk sold in the cities of New York State is pasteurized. From 1917 to 1929 inclusive, there have been 91 milk-borne outbreaks, an average of 7 yearly, with the total of 2,511 cases.

Typhoid fever has been responsible for 64, or 70 per cent, of the outbreaks, about 5 per cent of all reported cases of typhoid fever belonging to the milk-borne classification. At the same time, 16 per cent of all reported septic sore throat cases, 0.1 per cent of diphtheria, scarlet fever and poliomyelitis also were due to milk-borne outbreaks.

Of the 91 outbreaks, 89 were traced to raw milk, in 2 instances certified milk being involved. In only 2 instances is it alleged that pasteurized milk was involved, and in 1 instance involving 23 cases of typhoid fever, it is alleged that reinfection occurred after pasteurization. In the other instance involving 29 cases of scarlet fever, there is reason to believe that the milk was not actually pasteurized. Both outbreaks traced to certified milk occurred in one county. The first occurred in 1920 and included 70 cases of diphtheria, while the second occurred in 1924 and involved 60 cases of paratyphoid.—Paul B. Brooks, Milk-borne Outbreaks in New York State, *New York State J. Med.*, Dec. 1, 1930.

LABORATORY

JOHN F. NORTON, PH. D.

STUDIES OF CHEMICAL STERILIZATION AND BACTERIOSTASIS

I. A STANDARD INHIBITION CONTROL FOR GERMICIDAL TESTS

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IN making bactericidal tests by any of the standard methods, or by modifications thereof, very careful inhibition controls must be made, in order to be sure that the apparent sterility of sub-cultures is not due to the presence of inhibitory amounts of the test drug, carried over in transfer. The omission of such controls from the earlier work is explicable on the basis that these tests were designed for the testing of phenols, most of which have a relatively low inhibitory action. When such tests, however, are used for the evaluation of many of the newer drugs, some of which have extremely high inhibitory action, the addition of accurate inhibition controls becomes imperative.

The following inhibition controls, which have been in use in this laboratory for some time, are proposed because they seem to parallel most closely the actual germicidal test.

A. The Drug Transfer—Let it be assumed, for example, that in the actual test the amount of drug employed is 5 c.c., the amount of inoculum 0.5 c.c. of a broth culture, the amount carried over to sub-culture one 4 mm. loopful of this drug-inoculum mixture, and that the amount of broth in the sub-culture is 10 c.c. Under these conditions, the following control should be made:

1. Mix 5 c.c. of the drug dilution to be tested with 0.5 c.c. of sterile broth, the latter corresponding to the amount of the inoculum in the actual test.

2. Transfer one 4 mm. loopful of this mixture to 10 c.c. of broth.

This gives in the sub-culture tube an exact parallel of the amount of drug which is carried over in the actual germicidal test.

B. The Inoculum—Some authors have contented themselves with inoculating their inhibition controls with a loopful of undiluted culture, and others have deemed it sufficient to inoculate their sterile sub-cultures from the actual germicidal tests, some 48 or more hours after the test. Such inoculations usually have been with undiluted cultures. Both of these methods are fallacious. Under the conditions cited above, the correct inoculation of the inhibition control should be made as follows:

1. Mix 5 c.c. of sterile water with 0.5 c.c. of the same tube of culture that is used in the germicidal test, and at the same time as the actual test.

2. Transfer one 4 mm. loopful of this mixture to 10 c.c. of broth in which has previously been placed one 4 mm. loopful of the drug-water mixture described under "A. The Drug Transfer."

This inoculum represents the maximum number of organisms that could

possibly be carried over to the sub-culture in the actual test. No inhibition controls which employ any larger number of organisms are valid. In fact, the point may well be made that it is not fair to use even this maximum number of possible organisms, as this method does not take into account the reduction of the maximum number by drug action in the actual test. By making culture dilution controls the exact point at which sub-cultures remain sterile, owing simply to the small number of bacteria present in the 5.5 c.c. of the test mixture, may be determined. It seems probable, however, that, without working with fractions of the maximum number of organisms, the controls outlined above are sufficiently refined.

It is obvious that this inhibition control may be expressed as a formula for use with any method.

Let D represent the number of c.c. of drug employed in the test.

Let B represent the amount of inoculum employed.

Let S represent the amount of the mixture of D plus B used for sub-culture.

Let T represent the number of c.c. of broth used for sub-culture.

The inhibition control then consists of the following steps:

1. Mix 1 D and an amount of sterile broth equal to 1 B.
2. Transfer the equivalent of 1 S of this mixture to 1 T.
3. Mix the equivalent in sterile water of 1 D with 1 B.
4. Transfer the equivalent of 1 S of this mixture to the 1 T previously used in the second step.

Such inhibition controls should be made with every dilution of drug employed and with every type of organism used. It is wise to run such controls in triplicate to allow for unavoidable experimental variation.

The author realizes that these controls must either be accepted by others as they stand or modified according to the consensus of opinion of other workers in this field. However, these or essentially similar inhibition controls must be included before germicidal tests can be considered valid. Certainly the importance of such inhibition controls cannot be too strongly emphasized.

SUMMARY

A method of making inhibition controls has been proposed by which valid germicidal tests may be made by any accepted method.

A MODIFICATION OF THE SEITZ 20 ML. FILTER

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THE advantages of the Seitz filter over many other types have been presented at length by the writer.¹ In the hands of many workers, however, results were not always satisfactory owing to a tendency on the part of such filters to leak air around the edges of the filter pad. This, of course, resulted in contamination of the filtrate. Air leakage is entirely avoidable pro-

vided a tight seal can be assured. With the type of filter at present on the market, pressure on the disc is secured by screwing down a threaded cylinder having a diameter of 44 mm. The base has the same diameter. Both top and base have a knurled flange which is 2 mm. thick. It is very difficult to secure a grip on these filters sufficiently firm to give the pressure necessary for a

tight joint. Further, the thinness of the flange makes the operation at times rather hard on the hands. By increasing the width of the flange it is possible to secure a better grip. By increasing the diameter of the cylinder more leverage can be obtained. The combination of wider and thicker flanges makes possible the application of much more pressure and assures an adequate seal. We have made a number of these filters and have found that in addition to much greater ease in assembling there have been no air leaks in any of our tests even when the pressure was greatly increased over that we had previously been using. One of the chief objections to the Seitz filter was the inability to secure sterile filtrates due to this leakage. It is felt that with the modification this objection has now been met.

An illustration showing the old and the new types is appended to show the differences between the two.



FIGURE I

A—old form. B—the modification

REFERENCE

I. Larkum, N. W. A Comparison of Seitz and Mandler Filters, *A. J. P. H.*, 19, 6: 670 (June), 1925

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Vital Statistics for Edinburgh, Scotland—One of the interesting facts disclosed by the annual report for 1929 is that for one year at least the population of Edinburgh has decreased. The present number is 427,538. This is 916 lower than it was in 1928. The present situation is accounted for largely by the birth rate, which was the lowest since 1918. At the same time the movement of population due to emigration has also been a contributing factor. Two hundred years ago the population was 40,000. The increase has been slow and steady. Expansion has been mainly due to extension of the city

boundaries. The latest was in 1921 when the population rose from 314,193 to 420,264. While the total population has decreased, there were, in 1929, 1,379 more inhabited houses in the city than in 1928. This is due to new housing schemes and modern ideas of health. There is a tendency to move to more suburban areas.

Edinburgh's birth rate of 17.1 for 1929 is the lowest rate among the 8 largest towns in Scotland. At the same time, the death rate has increased to 15.1, the highest since 1922. The infant mortality rate is 80.—*Canad. M. A. J.*, 23: 854 (Dec.), 1930.

Vital Statistics for Vienna, Austria—The population for Vienna at the end of July, 1930, has been announced as 1,843,759, consisting of 850,733 males and 993,026 females. In July there were 260 fewer living births than in the previous month; only 296 of these births occurred in the home; the remaining 1,149 took place in institutions. The total number of deaths in July was 1,854 or 179 fewer than the previous month.

At the end of 1929, the population of Vienna was reported as 1,848,147, which is almost 30 per cent of the whole population of the republic. The total number of deaths for 1929 was 26,682, of which 1,044 were due to suicide and 75 to homicide. The chief cause of death was diseases of the heart and circulatory organs; cancer and neoplasms occupied second place and tuberculosis came third. Of the infectious diseases, diphtheria showed a high incidence; then came puerperal fever, typhoid, scarlet fever, measles and whooping cough. Not a case of Asiatic cholera, typhus or smallpox was reported in Vienna during 1928 and 1929.—*J. A. M. A.*, 95: 1985 (Dec. 27), 1930.

Diphtheria Immunity—Schick tests were made on 883 children in a small community, Rochester, Minn., with a population of about 20,000. The children ranged from 1 to 18 years of age. There were 411 of these children who had not been subjected to measures of diphtheria immunization and whose tonsils had not been removed. In this group there were 99 children under 6 years of age, 4 of whom showed negative reactions. Two of them had previously had diphtheria. Of the group from 6 to 18 years, 312 in number, 52 or 16.6 per cent gave negative reactions. In the group as a whole, 13.6 per cent of the Schick tests gave negative results.

In the second group were 96 children

who had been tonsillectomized more than 6 months previously but had never been immunized against diphtheria. Nineteen were under 7 years of age and all gave positive results. Of the 77 between 7 and 18 years of age, 20 or 25.9 per cent gave negative reactions. In this group as a whole 20.8 per cent gave negative reactions.

In the third group were 24 children who had received toxin-antitoxin or toxoid and who had not had their tonsils removed. There were 32 under 5 years of age and all gave negative reactions. Of the 209 children between 5 and 18 years, 153 or 73.2 per cent gave negative reactions. The group as a whole showed 76.7 per cent negative reactions.

The last group was made up of 135 children who had received toxoid or toxin-antitoxin and whose tonsils had been removed more than 6 months previously. All of these children were between 5 and 18 years of age; 101 or 74.8 per cent of them gave negative reactions.

These results indicate that tonsillectomy had no effect on humoral immunity against diphtheria in this small community. The number of tests in this case was too small to allow accurate deductions, however. There have been only 30 cases of diphtheria in Rochester in the last 5 years; of these 7 cases were definitely imported and resulted in 3 secondary cases.—K. B. Geddie, Effect of Tonsillectomy and Adenoidectomy on Diphtheria Immunity. *Am. J. Dis. Child.*, 40: 1032-1034 (Nov.), 1930.

Pneumococcus Type I Pneumonia—A series of 3,662 cases of pneumococcus pneumonia in adults and 271 cases in children admitted to Bellevue Hospital for the past 10 years was studied clinically and bacteriologically. Of this series, there were 1,161 cases of type I infections and these form the basis for this investigation. The most

serious complications among the 1,131 adults were empyema, 73 or 6.5 per cent; meningitis, 20 or 1.8 per cent; and acute arthritis, 10 or 0.9 per cent. The common complications in the 30 children were empyema and otitis media, each of which occurred in 5 cases.

In the period from 1920 to 1929, in the series of 412 cases not given serum, there was a mortality of 28.2 per cent. The death rate for type I pneumonia in Bellevue Hospital has shown a steady rise since 1921. In the period from 1921 to 1929, the mortality rate increased from 20 per cent to 42.8 per cent. The mortality rate varied with the age of the patients; in children under 12 years old, it was 3.3 per cent; each decade the rate was higher and in patients over 50 it was 46.2 per cent. The mortality rate in patients with serious complications was very high; 29 cases of pneumococcus type I empyema showed a death rate of 51.7 per cent.

Huntoon's antibody solution was given to 171 cases of type I pneumonia for two years, 1920 to 1922. There was a death rate of 14 per cent; 171 control cases admitted during the same period showed a death rate of 21.1 per cent. In 56 cases admitted within 48 hours after onset, treatment with antibody solution resulted in a death rate of only 8.9 per cent, whereas 68 control cases showed a death rate of 23.5 per cent.

From 1924 to 1929, alternate cases of type I pneumonia were treated with Felton's concentrated antipneumococcus serum. There were 239 cases treated with a death rate of 20.1 per cent; 234 alternate controls showed a death rate of 31.2 per cent. In this 4-year period, the death rate of the treated cases varied from 17.7 to 22.9 and for the controls from 26.3 to 39.4 per cent. There was a further reduction in the death rate to 11.7 per cent in cases treated within 72 hours after onset as

compared with a rate of 26.8 per cent for 97 controls. There were 48 deaths among the patients treated with Felton's serum but some morbid process other than pneumonia was a factor in nearly every case.—R. L. Cecil and N. Plummer, *J. A. M. A.*, 95: 1547-1553 (Nov. 22), 1930.

Tuberculous Infection in School Children—This study is based on 42,071 children examined and given the Pirquet tuberculin test during a period of 3 years. These are the results of the beginning of a 10-year program begun in Massachusetts in 1924 to find children who had the primary or juvenile form of tuberculosis. Since the study of the cases examined during the first 3 years' work in the clinics, 2 more years' work has been added. During the 5 years, there were 101,118 children given a tuberculin test and the positive reactors X-rayed. Twenty-eight per cent of the children gave positive reactions during this period.

Different sections in the same city showed a wide variation in the percentage of reactors. In one city of 60,000, the number of children in different school districts reacting to the tuberculin test varied from 11 per cent to 60 per cent. In the 3 junior high schools in this city, there were 22, 26 and 26 per cent reactors, respectively. In 8 schools, the children in the first six grades had a much higher percentage of reactors than the older children.

A study of children by the nativity of mothers showed no marked variation in the number of reactors when there was no history of contact. This study showed that approximately twice the number of children react to the tuberculin test when there is a history of exposure to pulmonary tuberculosis. The Teuton group showed 3 times as many reactors in the contacts. The Teuton non-contact group, 533 in number, showed only an average number

of reactors. The percentage of acknowledged contacts in each group ranged from 11 to 19 per cent. The highest percentage of contacts and the highest percentage of infections were shown for the Latin group.

Irish, Canadian and German boys showed a much higher incidence of infection than girls of the same nationalities. The reactors among the boys exceeded the girl reactors by more than 24 per cent in the Irish group, 50 per cent in the Canadian group and 52 per cent in the Teutons. In other nationalities, the percentage of reactors in the two sexes was approximately the same.

Comparing the results of the tuberculin survey made in 1917 by the Framingham Demonstration and the one made in the same city in 1926 by the State Clinic, a marked reduction in tuberculous infection after 9 years of intensive antituberculosis work was shown. The children in the 1926 group averaged 5.7 years older than those examined in 1917 but the percentage of reactors was 8.5 per cent less. The numbers considered in this comparison are small, but the marked reduction in infection checks up with the reduced death rate in Massachusetts for all forms of tuberculosis, which declined from 144 per 100,000 in 1917 to 73 in 1927.—H. D. Chadwick and D. Zacks, *The Incidence of Tuberculous Infection in School Children*, *Tubercle*, 12: 111–118 (Dec.), 1930.

The Future of the Diabetic Child
—A series of 625 diabetic children treated from 1898 to 1930 formed the basis for this study. Of these children, 212 are dead and 413 living. The series contains many patients in whom a variety of methods of treatment has been employed. In order to compare the data fairly, the living children were divided into two groups, 81 children treated before the use of insulin was

begun and 332 treated subsequently.

The skin of some of the children of both groups has shown xanthosis. *Xanthoma diabeticorum* has proved a rare complication, being recognized in only 3 cases. Tuberculosis or tuberculous lesions have occurred in 10 of the total 625 children, in 7 whose diabetes began before 1922 and in 3 whose onset was after that date. Only one child has cataracts. However, 3 of the fatal children who had never had insulin had cataracts.

Calcification of the blood vessels of the legs has occurred in 11 diabetic children, all of whom had onset of diabetes before 1922. The average duration of diabetes at discovery of sclerosis was 7 years. In 5 of these children the cholesterol of the blood was examined prior to the appearance of sclerosis; in 2 the cholesterol was above 230 mg.; in 3 it was persistently below. The average proportion of cholesterol in the group was 212 mg. per 100 c.c.

The children in this group with the longest duration of treatment are children treated by Dr. Joslin in the Allen era with few calories and relatively low quantities of carbohydrate. These children gained tolerance for carbohydrate. This treatment kept alive 50 diabetic children whereas children treated by other methods died. Insulin has been used 7 years by 59 diabetic children in this group. None of these have shown evidence of sclerosis whereas 3 of the pre-insulin children studied had evidence of calcification of the vessels of the legs.

The diabetic child has taught lessons of great importance: first, that heredity is an undoubted etiologic factor in diabetes; second, that the child affords new evidence to the theory that over-nutrition is a precursor of diabetes; and third, that cataracts and arteriosclerosis can occur in pure diabetes under the age of 20 years.—P. White, *J. A. M. A.*, 95: 1161–1162 (Oct. 18), 1930.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

EPIDEMIC OF INTESTINAL DISORDERS IN CHARLESTON, W. VA., OCCURRING SIMULTANEOUSLY WITH UN- PRECEDENTED WATER SUPPLY CONDITIONS

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THE great drought of 1930 caused public water supply conditions in Charleston, W. Va., from August to December, 1930, which probably have never been duplicated in a public drinking water supply for intensity of pollution. A widespread epidemic of intestinal disorders similar to those caused by mild food infection or a strong cathartic occurred in the city during the latter part of October and early November in which it was estimated that between 8,000 and 10,000 persons in Charleston were affected.

Throughout the entire period of 4 months—August to December, 1930—in which the acute and offensive taste and odor conditions existed in the water supply and a high pollution thereof continued due to a river reversing its flow, the filtration plant operation was above reproach, and daily independent bacteriological tests by three different water testing laboratories showed that the U. S. Treasury Standards for a bacteriologically safe drinking water had been met.

Charleston is furnished its public water supply of approximately 7 m.g.d. by a private water company, the source being the Elk River. This river with a 1,550 sq. mi. drainage area and a normal flow of 100 to 500 m.g.d. joins the canalized and navigable Kanawha River

1¼ miles below the water supply intake. Previous low water flow in the Elk over a period of 50 years was 19 sec. ft. Below the water intake are many sewers and a garbage incinerator which, due to laxity on the city's part during 1929 and until July 24, 1930, was discharging weekly 200 tons of household garbage and wholesale produce to the river. The State Water Commission, which has authority over stream pollution, ordered this grossly insanitary practice of discharging garbage into the stream stopped on July 24, 1930, and the city complied immediately.

Early in August the Elk River flow fell below the city's needs to the extent of 2 or 3 m.g.d., and then the Kanawha River, carrying the excessively high organic content from garbage putrefaction, with practically zero dissolved oxygen, and so polluted with sewage as to give a bacteria count of 50,000 to 100,000 per c.c. and *B. Coli* in 1/1,000 c.c., flowed upstream to the water intake. A heavy growth of algae developed in this filthy pool into which only a few million gallons of fresh water entered daily and a woody, mouldy, disagreeable taste developed with which strenuous water purification methods could not cope.

The following purification measures.

in addition to the regular sedimentation, filtration and final chlorination processes, were tried: prechlorination to reduce the heavy pollution load, using copper sulphate in the river basin to kill algae; aeration to attempt to replace the dissolved oxygen; and activated carbon fed into the inlet to the sedimentation basin to absorb the disagreeable flavors. Permanganate, ammonia, super-chlorination and dechlorination treatments also were tried in an effort to get rid of tastes and odors. All these measures were ineffective in removing entirely the taste and odor which came and went in varying intensity.

The prechlorination dosage finally reached a peak of 20 lbs. per m.g. The daily operation throughout August, September, October and November was under the watchful eyes of capable sanitary engineers. Every effort was made to see that no unsafe water passed into the city mains. Bacteriological tests indicate that, measured by the present accepted U. S. Treasury Standards for bacteria content, the water was safe.

Microscopical tests during August and September revealed a b u n d a n t growths of blue-green algae of several different types capable of causing the objectionable odor. Cycles of algae growth were followed by development of crustacea, daphnia and other allied water flea organisms being present in such great numbers that a glassful of the raw river water appeared to be actively vibrating from the infinite number of organisms present.

So intense and disagreeable was the taste, particularly in the latter part of October and in early November, that, naturally, the general public refused to use the water for drinking purposes.

The State Health Department, relying upon the standardized bacteriological tests as a criterion for safe water, urged the general public to use the purified public supply rather than that from unknown wells and springs, or bottled

waters which were being widely dispensed throughout the city for beverage purposes. The concentration of bacterial pollution of the lower Elk River pool, made up of both Kanawha River and Elk River waters, increased proportionally as the weeks went on because the Elk River practically dried up. Prechlorination had become the normal operation now in order to put out a safe water, a residual chlorine being held throughout the sedimentation basin, the filters and clear well.

Whether the intestinal disorders in the city during the latter part of October and in early November can be attributed to the water is still a mystery; but it is a fact that widespread disorders were noted wherever the water supply mains went. After careful epidemiological studies had been made by state and federal public health agencies, it was recommended that the intake be moved to the Kanawha River to a less sewage polluted zone. The water company is now spending \$100,000 to install such an emergency intake.

On November 10 Dr. W. T. Henshaw, Commissioner of the State Department of Health, following a report to him by Dr. David Littlejohn, his epidemiologist, and E. S. Tisdale, state sanitary engineer, that several thousand cases of an acute intestinal ailment existed in Charleston, communicated with Surgeon General Hugh S. Cumming of the U. S. Public Health Service, stating the unusual conditions and asking assistance to determine if possible the real cause of the trouble. The Service immediately complied and Surgeon M. V. Veldee and Sanitary Engineer R. E. Tarbett arrived in Charleston on Armistice Day. They spent 3 days reviewing carefully the findings of the State Health Department, going over the bacteriological records, and making independent epidemiological studies. Their report describes the type of ailment from which Charleston people suffered:

A house-to-house canvas of a fair group of families living in two widely separated sections of the city reveals that from 10 to 15 per cent of the population was ill during the first week of November with an acute gastrointestinal ailment. This illness was characterized by a sudden onset, pain in the region of the stomach, usually nausea or vomiting or both, and followed by diarrhea of varying severity. Those ill had essentially no fever and the illness was very largely confined to persons over 10 years of age. The duration of illness varied with severity—usually from less than 1 day to upwards of 4 days.

In addition an interview was had with a representative group of the local physicians. The symptoms observed by them among their patients correspond with those recorded above.

The character of the onset and the ensuing symptoms do not suggest a disease caused by a bacterial infection but rather a poisoning by some substance which acts as a gastrointestinal irritant. In fact, the symptoms are similar to those produced by a strong cathartic.

In the case of the local source of water supply, the quiescent condition of the pool has allowed anaerobic decomposition (fermentation in the absence of oxygen) to take place in the accumulated sludge, with the absorption of the products of decomposition by the overlying water to an extent not possible in a flowing stream. It is entirely possible that such products might not be removed by the known processes of water purification.

In so far as we are aware the circumstances surrounding the public water supply of Charleston at the present time are entirely unprecedented in this country. In view of this fact we do not feel that the occurrence of an outbreak such as has taken place in Charleston within the past few weeks could have been reasonably predicted, particularly since the bacteriological records continued to indicate a drinking water of safe quality.

DEDUCTIONS FROM UNUSUAL CONDITIONS AT CHARLESTON, W. VA.

It is of note that the Charleston malady affecting several thousand people was experienced during unusual drought conditions. Actual septic conditions similar to those found in a septic tank prevailed in Elk River near the water works intake due to decomposing garbage, and sludge from the sedimentation

basin, lying on the river bottom. Violent ebullition of bubbles took place when this river bottom sludge was disturbed. River traffic—stern wheel paddle-boat variety—was quite active in this stretch of river.

Whether products of anaerobic decomposition of nitrogenous or carbonaceous matter could be sufficiently concentrated in the water to produce a condition simulating food poisoning in those drinking the water has not been shown. Laboratory tests did show that the odoriferous compounds were quite readily removed by boiling and there appeared to be a large amount of oily substances in the water.

It is of interest to note that *Public Health Reports* of November 21, 1930, give an account of R. R. Spencer's studies of a persistent type of mild dysentery-like epidemic occurring in the national parks during the drought months of the year. His description of the malady (short duration, nausea, sharp pain in abdomen and diarrhea) is similar to the trouble which occurred in Charleston when drought conditions were at their height.

Neither the U. S. Public Health Service nor the State Health Department has stated definitely that the bacteriologically safe water supply was responsible for the epidemic, but it is certain that most unusual conditions have existed with reference to intensity of raw water pollution. The recommendations which both federal and state services have made were to the effect that

1. Boiling the water would drive off the substances responsible for the objectionable tastes and odors.

2. A temporary intake should be sought in the Kanawha River in a zone of less pollution since the water plant was operating under too great a sewage load.

3. A new water works intake be provided so that 1930 drought conditions could not be duplicated.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., PH. D., AND LEONARD GREENBURG,
M. D., PH. D.

Occupational Nystagmus in Train Dispatchers—Summary: Among the 121 train dispatchers examined, in widely separated sections of the country, and from seventeen railroads, occupational nystagmus has been detected, involving 81 individuals, or 67 per cent. In addition, in 2 cities, among 30 persons examined, 22, or 70 per cent, presented this condition.

The nystagmus found was essentially all horizontal, with marked variation in the rate of motion, and with some variation in the rates for the two eyes.

This train dispatchers' nystagmus appears to be unassociated with aural conditions, although occupational deafness of 56.2 per cent has been noted, which is more commonly present in the left ear, due to the wearing of the hearing mechanism on that ear. It is believed that the noises common to train dispatching are responsible for the occupational deafness.

The nystagmus encountered among train dispatchers is accepted as occupational in origin, and is attributed to the continual motion of the large paper train sheet beneath the eyes, and the movement of the head and eyes over the train sheet, both necessary in the continual recording of train movement data.

It is maintained that the high frequency of the use of eyes in connection with train sheet work leads to overworking of the ocular mechanism, resulting in a nervous syndrome characterized by nystagmus, blepharospasm, some visual impairment, and ocular discomfort.

This occupational nystagmus of train dispatchers is less severe than the average of miners' nystagmus, and no case has been encountered that in itself was to be accepted as the cause of total disability.—Carey P. McCord, Paper delivered before the Industrial Hygiene Section of the A. P. H. A. at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.—E. R. H.

Life Conservation Studies. Cardiovascular Lesions Among One Thousand Industrial Machine Operators. A Report of One Thousand Physical Examinations of Machine Operators—Summary:

1. One thousand machine and hand tool operators were carefully examined during the past year by the Heart Council of Greater Cincinnati.

2. Only 4 of these men were found essentially free from defects; 836 men out of the 1,000 had significant physical defects such as were considered to be likely to interfere with their general well-being and efficiency. The defects were unknown to 885 of the men, or at least they made no complaint of these defects at the time of the examination. In the opinion of the examiners, 874 of the group would definitely profit by early medical care.

3. Men under age 45 predominated in these occupations in Cincinnati.

4. One out of every 5 had never been vaccinated.

5. Thirty-one per cent had some significant cardiovascular defect. There was a definite upward trend in cardiovascular disease among this group after age 40 which corresponds to the mortality from this disease in the United States vital statistics. The incidence of cardiovascular lesions increased markedly with overweight in this group. The increase in the incidence of heart disease among overweight is especially great past the age of 40.

6. Overweights were prone to high blood

pressure; underweights to low blood pressure.

7. Albuminuria and glycosuria are both appreciably more frequent among those with cardiovascular lesions than for this group as a whole.

8. The query is definitely raised as to the relationship between mental strain and cardiovascular lesions in the light of the fact that the incidence of these lesions among this factory group where the mental strain is comparatively slight is less than among 1,000 clerks who work under a higher degree of a mental strain and about one-half as great as that found by McCord in a group of train dispatchers among whom mental strain is excessive.

9. Eighty per cent of these men have dental attention only in emergencies.

10. Three-quarters have some eye defect and a large percentage of the attempts at correction of these defects are unsuccessful.

11. Tuberculosis findings were incomplete because of the difficulty of securing X-ray examinations.

One definite and incontrovertible point brought out in the first two studies is the extraordinarily high incidence of physical impairments, much of which was unknown to the examinees, together with the high percentage of the men with impairments which the examiners believed could be remedied by medical care. The findings add significantly to the accumulating evidence of the importance of periodic health examinations.—William Muhlberg, Floyd Allen, and Bleecker Marquette (Cincinnati). Paper read before the Industrial Hygiene Section of the A. P. H. A. at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.—E. R. H.

An Industrial Health Survey of 1,000 Factories in Chicago—A simple questionnaire of 15 questions which could be answered by "Yes," "No," or a Figure, was sent to 1,584 factories, mercantile establishments, department stores, banks, laundries and others, the list being supplied from the Directory of the Illinois Manufacturers Association, from the Association of Commerce

and a social agency of Chicago, the aim being to reach all plants with 25 or more employees. From this group, 584 were excluded because of several reasons, leaving 1,000 on which the study was made, or about 16 per cent of the original list.

It was found that: (1) 820, or 82 per cent, of the plants replying had less than 300 employees, and (2) 881, or 88 per cent, had less than 500. All industries in Chicago employing more than 1,000 employees replied to the questionnaire. Among the larger were 54 employing 500-999; 47 employing 1,000-4,999; 8 employing 5,000-9,999; and 10 employing over 10,000. The total employees in the 1,000 institutions were 500,642, of whom 438,948 were classified as to sex, there being 73 per cent male and 27 per cent female.

A survey of health service showed that 3 per cent had a hospital; 5 per cent had a dispensary; 52 per cent had a first aid room—this included any room in which a first aid kit was kept; 43 per cent had a doctor—here the doctor was on call in 82 per cent of instances; 12 per cent had a nurse, but only 72 per cent of these were registered nurses, while 1 per cent employed a part-time nurse; 35 per cent had agreements with local hospitals covering sickness and injuries; 13 per cent had employees' benefit associations; about 100 per cent were covered by compensation insurance; 33⅓ per cent had group life insurance; 49 per cent kept sickness and accident records—15 per cent kept accident records only; while 75 per cent of the plants wanted a report of the survey.

The significant facts revealed in this study were:

1. The medical service provided by Chicago industries is of a limited character as evidenced by the answers to the first five questions, especially in regard to medical and nursing service. The medical and nursing service for the most part is of an emergency character.

2. Adequate health work presumably can only be done by a full-time medical service. Indications of health work were not significant in this study.

3. Plants in Chicago apparently are quite interested in the general welfare of their employees as evidenced by the answers to the balance of the questionnaire.

4. The answers were classified according to size of the plant, but no startling evidence was revealed. For the most part the medical and nursing service is still concentrated in the larger plants, leaving the greater majority of plants without service beyond a strictly emergency character

There is evident tremendous interest in health among the employers and any program contemplated by a tuberculosis

organization should include the large as well as the small plant. An educational program is clearly indicated from the above facts brought out by the survey and steps were taken to provide this service. "We are looking forward to the day when all cities with over 100,000 population will have a program. We in Chicago feel that industrial health, like community health, is purchasable."—Robert B. Watson, Industrial Secretary, Chicago Tuberculosis Institute. Paper read before the Industrial Hygiene Section of the A. P. H. A. at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.—E. R. H.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Biochemical Studies on the Antineuritic Vitamin—As a contribution to the study of the antineuritic vitamin, the authors describe a method of chemical purification which is controlled by the application of physiological test methods previously described by one of the authors (M. I. Smith, *Pub. Health Rep.*, 45 (1930), 116-129). The resulting product was further compared with a small supply of vitamin crystals obtained from Dr. Jansen and made by the Jansen and Donath method. The smallest curative dose of this type of the crystals was found to be 0.04 mg. containing 0.0069 mg. nitrogen. The most highly purified fraction obtained by the authors on the same basis required 0.05 mg. daily dose containing 0.0062 mg. nitrogen, indicating almost identical activity on a nitrogen basis, although the product described here does not crystallize. The vitamin is prepared from fresh brewer's bottom yeast by adsorption on fullers'

earth after removing coagulated protein and insoluble matter. This so-called "activated solid" was further treated in alkali and acid solutions, extracting with chloroform and precipitating the filtered acid aqueous solution in acetone.

Further treatment is outlined for the separation of the sodium chloride, and by repeated precipitation a powder is obtained containing 7 to 11 per cent of nitrogen. The two samples analyzed yielded 0.1 and 3.3 per cent chloride. Several concentrates prepared by this method were administered to rats to cure polyneuritis. The activity of these concentrates ranged from 0.05 to 0.30 mg., the dose required to effect the cure of polyneuritis in rats on a diet adequate with the exception of this antineuritic vitamin.

Experiments were conducted on rats receiving a diet deficient in both the antineuritic and the thermostable vitamin (B₂ or G), and those on a diet deficient in the antineuritic vitamin

alone. After the rats developed polyneuritis symptoms, the autoclaved yeast was replaced by an equivalent amount of starch. The antineuritic concentrate was then administered intravenously in about 20 per cent of the minimal curative dose required. The animals recovered from polyneuritis but did not grow and their death followed in 22-32 days. Increasing the dose 5 to 10 fold prolonged the life of the animals sufficient to show skin lesions. With the daily injection of 1.0 mg. of the antineuritic concentrate to rats with developed polyneuritis and the administration of the thermostable factor normal growth resulted. It was concluded that this concentrate was highly active in antineuritic potency and probably free from the thermostable factor.—Atherton Seidell and Maurice I. Smith, *Pub. Health Rep.*, 45: 3194 (Dec. 26), 1930.

The Antirachitic Action of Cod Liver Oil and Irradiated Ergosterol in Parathyroidectomized and Thymectomized Rats—The observations of investigators who have studied the effect of antirachitic agents in the experimental tetany of dogs and monkeys are at least conflicting, both a loss and an increase in blood calcium being reported, the latter particularly with large doses of irradiated ergosterol.

In the present experiments, young rats, 25-40 gm. were used after complete extirpation of the parathyroids under anesthesia. The rats on a low phosphorus rachitogenic diet were given cod liver oil with a pipette. Radiograms were taken at the beginning and end of the experiments. A commercial irradiated ergosterol claiming a potency 10,000 times that of cod liver oil was diluted with 10,000 parts olive oil and administered by pipette. Consistent results are shown in 4 sets of experiments. Four drops daily of cod liver oil resulted in complete prevention and 4 drops for the last 5 days were a curative dose in

the parathyroidectomized rats. Without the oil, rickets developed in both the untreated operated and unoperated controls. With two drops cod liver oil daily for the last 5 days marked healing occurred in parathyroidectomized rats and also in the unoperated controls.

Similar results attended the experiment using the commercial activated ergosterol and complete prevention in parathyroidectomized rats resulted with a daily dose of 1 drop of the diluted preparation. Marked healing occurred with 5 daily doses of 1 drop of the preparation both in parathyroidectomized rats and in unoperated controls.

The rickets were more severe in the operated than in the control rats. Sections of the neck organs showed that no remains of parathyroid tissue and accessory glands were in evidence. Results are shown in one experiment on rats after complete removal of the thymus glands. Two drops daily of cod liver oil gave complete protection in thymectomized rats as well as the unoperated controls and 5 daily doses of 2 drops showed a marked healing both in the operated and unoperated rats.

One experiment is reported on rats after removal of both thymus and parathyroids and administration of irradiated ergosterol. One drop daily prevented rickets, which developed in the unoperated controls. It is apparent that cod liver oil and activated ergosterol in therapeutic doses are antirachitic in the absence of either or both the parathyroids and the thymus.—Alwin M. Pappenheimer, *J. Exper. Med.*, 52: 805 (Dec. 1), 1930.

Vitamins in Sugarcane Juice and in Some Cane-Juice Products—This paper reports the results of experiments carried out to determine the vitamin B (complex) and vitamin D potency of the juice of sugarcane. The juice was obtained from 3 lots of sugarcane stalks shipped at different times

and from different sections of the country. In addition to estimating the vitamins in the juice, comparison was made of the vitamin B potency of juice obtained from different parts of the same cane stalk. Several sugarcane products, including cane sirup, and different samples of blackstrap molasses and cane cream were also examined.

From the growth curves given for the different experiments, sugarcane juice is found to be a poor source of the antineuritic vitamin. It contains a small amount of vitamin A and little, if any, vitamin D. The juice from the upper portions of cane stalks is richer in this vitamin than juice from the lower portions. Juice obtained from bagasse by using high pressure is richer in the antineuritic vitamin than ordinary cane juice. Cane sirup, Louisiana and Porto Rico blackstrap molasses, and cane cream, products made from sugarcane juice, were found to contain negligible amounts of vitamin B.—E. M. Nelson and D. Breese Jones, *J. Agr. Research*, 41: 749 (Nov. 15), 1930.

The Length of Survival of Paratyphoid Bacilli in Foodstuffs—The experiments reported in this paper are of considerable importance in clarifying the question of the longevity of members of the Salmonella group and their agglutinogens when they are introduced into commercially canned foods, such as spinach, corn, and peas. Several authentic strains of *S. enteriditis* and *S. aertrycke* were used as test organisms. Incubation at room temperature was used throughout the experiments.

Of the three vegetables used canned spinach was found the most favorable medium for growth for all the test organisms. Canned corn proved to be the least suitable medium for growth, especially when inoculated with strains of *S. aertrycke*. No viable organisms could be demonstrated in canned corn which had been inoculated with *S.*

aertrycke after 21 days. In another instance some viable bacilli of this strain were recovered from corn after 75 days. All *aertrycke* organisms were dead after 100 days. Canned corn was somewhat more favorable as a medium for *S. enteriditis*, sterility being observed in from 90 to 170 days.

In canned peas, both organisms lived for at least 200 days. In canned spinach both organisms survived for much longer periods than they did in either corn or peas. In this vegetable, *S. enteriditis* was alive at the end of one year, while *S. aertrycke* was still alive at the end of 3 years. The persistence of the agglutinogens of these organisms in the canned vegetables was determined by the incubation of small amounts of liquor from the cans into rabbits and then testing the rabbits' blood serum for agglutinins. These tests were made 3 years after the canned vegetables were inoculated; during this period the bacilli had died in all cases—except that of *S. aertrycke* in canned spinach. In these tests, the thermostability of the various agglutinogens was observed. The injection of unheated inoculated canned vegetable material gave rise to easily recognizable agglutinins in all cases 3 years after the foods had been inoculated. Relatively slight heat apparently destroyed or greatly reduced the enteriditis agglutinogens. Some thermostability was observed in the case of enteriditis agglutinogens from canned peas.

The *S. aertrycke* agglutinogens were observed to be quite thermostable, giving rise to definite agglutinins when heated material was injected into rabbits. The author found, in other trials, that *S. aertrycke* agglutinogens withstood autoclaving at 11 lb. pressure for 50 minutes. These observations are important as bearing on the possibility of detecting dead organisms of this group in heat preserved foods.—L. P. Doyle, *J. Infect. Dis.*, 47: 92 (Aug.), 1930.

CHILD HYGIENE

RICHARD A. BOLT, M. D., DR. P. H.

Racial Hygiene—It is quite evident that if any further decided reduction in infant mortality is to be effected it must be brought about by applying well known social, medical and hygienic principles to the prenatal, natal, and neonatal periods. Unquestionably, greater safeguards thrown about the prospective mother and more skilled attention at childbirth will preserve more infant lives and reduce considerably the risks to which both mother and babe are exposed. This, of course, will not affect appreciably the quality of those who survive. Why should this interest the health officer? Keeping down the morbidity and mortality rates is conceived to be his duty; he should not wander into the occult and controversial fields of heredity and eugenics. Does not the pasture of eugenics provide sufficient room for his exercise?

But the progressive health officer, interested in the broad field of child welfare, cannot overlook the problems of racial hygiene. Efforts toward conservation of children, communicable disease control, or development of more vigorous life meet at the threshold factors emerging from inherent defects of the individual, differing degrees of intelligence, and constitutional weaknesses. Whether he acknowledges these differences or not the public health officer comes face to face with them in his everyday dealings with enfeebled stock. Questions must arise regarding differential birth rates, feeble-mindedness, and the impoverishment of germinal plasma with so-called "racial poisons." Sooner or later the health officer will have to make decisions as to how far he feels it necessary to carry

out education along the lines of social hygiene, whether to establish maternity clinics, or to lend his influence to the birth control movement. It seems proper to recommend, therefore, that the health officer inform himself broadly along these lines by reading books and articles from the pens of thoughtful investigators and writers.

A beginning might be made with such a thought provoking book as *Racial Hygiene*, by Thurman B. Rice. This is a very practical discussion of the problems of eugenics and race hygiene, written in an easy, straightforward style. To follow up the subject in some detail the list of references given by Rice might well be used.

Causes of Fetal Death—The suggestion is offered at the very beginning of this child hygiene series because in seeking the reasons for fetal and early infant mortality it is not possible to lay a finger upon the exact cause or causes in many cases. The very careful investigation into the deaths of 300 fetuses conducted by Eardley Holland* is an illustration in point. After exhaustive clinical, pathological, and serological studies, Holland found that in 11 per cent of the cases no definite cause of death could be determined. Other investigators have found that from 10 to 15 per cent of such cases show no evident pathological lesion to account for death.

On the other hand, enough reliable data exist to make possible the assignment of proper causes to many deaths;

* Report on the Causation of Foetal Death. *Reports on Public Health and Medical Subjects*. Ministry of Health of England, No. 7. 1922.

among these are syphilis, the toxemias of pregnancy, complications of labor, prematurity, and diseased fetal and maternal states. Great concern is manifest at present in the preventability of fetal and early infant deaths so intimately involving the life of the mother.

One of the most informative and constructive reports at the recent White House Conference was that on maternal and early infant care. It showed clearly the need for more precision in diagnosis and better classification of these cases; for better obstetrical education, and control of midwifery; for more widespread prenatal care of a thorough type, and especially for more-skilled attention at time of birth, under favorable conditions, and with expert care for the new-born. This report naturally arouses inquiry as to how successful prenatal care has been in the reduction of maternal and early infant mortality.

Value of Prenatal Service—This can be answered best by the most outstanding continuous maternity care conducted in this country—the Maternity Center Association of New York. This association has carried out an intensive piece of work in New York City since 1922, and has kept such records that it is now possible to evaluate results in terms of mothers' and babies' lives saved. The routines established by this organization and the "Standards for Maternity Care" which it has set up have been taken as models throughout the country.

"A Recent Statistical Study of Maternity Care," by Louis I. Dublin and Hazel Corbin, appeared in the *American Journal of Obstetrics and Gynecology* for December, 1930. It points out that during the past 8 years the Maternity Center Association cared for 4,726 cases. Of this number, 28 per cent first came under observation before the 5th month of pregnancy; 34 per cent in the 5th or

6th month, and 38 per cent during the last 3 months of pregnancy. The following results are of particular interest:

1. During the entire period of 8 years no woman under care died before confinement.

2. Eleven mothers died after delivery from puerperal causes, making a rate of 2.2 per 1,000 live births, which may be compared with a total rate of 5.3 maternal deaths per 1,000 live births among white women in New York City. A more striking comparison can be made in the Bellevue-Yorkville district with the mothers who did not have the care of the association; a rate of 6.2 is shown which is nearly 3 times as high as for the mothers who had care in the same district.

3. There were 4,596 live-born babies, 123 stillbirths, and 132 live babies died before reaching 1 month of age.

4. There were 274 premature deliveries, 61 of which were miscarriages. The stillbirth rate was 26 per 1,000 births, which compares very favorably with the total rate for white babies in New York City in 1928, 50 per 1,000 births. The number of stillbirths was 42 per cent lower in the association group than in the rest of the district.

The neonatal mortality rate (under 1 month) was 28.7 per 1,000 live births. This was only one-third of the rate (42.9) for the rest of the Bellevue-Yorkville District.

It is impossible to escape the conviction that this work "demonstrates that, on the score of all essential indexes, prenatal care, as conducted by the Maternity Center Association, produces results."

There comes from an entirely different quarter a report which emphasizes the importance of prenatal care combined with good hospital care, or care in the homes. Sir Arthur Newsholme, writing in the *Quarterly Bulletin* of the Milbank Memorial Fund for July, 1930, gives an instance of exceptionally low maternal mortality for patients looked after by the East End Maternity Hospital of London. The maternal mortality of hospital patients over a series of years was remarkably low, being in 1921-1926 only 1.1 per 1,000 live births; from 1927 to 1928, 1.19, while the rate for patients delivered in their own homes was lower still, being 0.29

in 1921-1926, and zero in 1927-1928. Sir Arthur states, "there can be no question as to the importance of the rigidly required and cheerfully accepted antenatal supervision" in addition to the quality of the hospital work both in the hospital and among its out-patients.

More Exact Classification—One of the most enlightening studies available is a recent publication of the Health Organization of the League of Nations. It appears as a "Memorandum relating to the Enquiries into the Causes and Prevention of Stillbirths and Mortality during the First Year of Life," and covers studies made by means of a uniform inquiry form and uniform instructions to investigators in Austria, France, Germany, Great Britain, Italy, the Netherlands, and Norway. A definite attempt was made to secure data in such a form as to be comparable between various countries. To this end "Nomenclatures of the Diseases Common to the First Year of Life and the Causes of Stillbirths" are set forth. A decided step in advance toward better classification is given under "Definition of Dead Births," which it is thought of sufficient importance to quote here:

The word "birth" means the separation and extrusion of a foetus from the body of the parturient woman. The birth is to be deemed complete at the instant when the whole of the body of the foetus—head, trunk and limbs—is outside the body of the mother.

The birth is to be deemed a live birth if after birth (as defined above) the infant breathes.

The act of respiration is incontrovertible evidence of life, and its continued absence is to be taken as proof of foetal death.

It is desirable, for statistical purposes, that a distinction should be made between the birth of a foetus which can normally be expected to be capable of existence independent of its mother and the expulsion of one which cannot—births in the latter category being regarded as miscarriages (abortions).

A foetus capable of an independent existence is a "viable foetus" and is the product of a gestation which has lasted at least 28 weeks. Such a foetus will normally measure at least 35 centimeters from the crown of the head to the base of the heel, the body being fully extended. The Committee is of opinion that the latter criterion is the more trustworthy.

Hence a "dead birth" is the birth of a foetus, after 28 weeks' pregnancy, in which pulmonary respiration does not occur; such a foetus may die either: (a) before; (b) during; or (c) after birth, but before it has breathed.

Such a revision in the classification of causes of maternal and fetal deaths as would make possible not only more exact determination of the causes of death, but also an indication of preventability, is to be welcomed. An advance in this direction appears in the recently revised International Classification of Causes of Death. It follows closely that used by Dr. Guilfooy in New York State, and is here presented:

- XI.* Deaths from Diseases of Pregnancy, Childbirth and the Puerperal State
 - 140 Abortion with septic conditions
 - 141 Abortion without mention of septic condition (to include hemorrhage)
 - 142 Ectopic gestation
 - 143 Other accidents of pregnancy (not to include hemorrhage)
 - 144 Puerperal hemorrhage:
 - (a) Placenta previa
 - (b) Other hemorrhage
 - 145 Puerperal septicemia (not specified as due to abortion):
 - (a) Puerperal septicemia and pyemia
 - (b) Puerperal tetanus
 - 146 Puerperal albuminuria and eclampsia
 - 147 Other toxemias of pregnancy
 - 148 Puerperal phlegmasia alba dolens, embolus, sudden death (not specified as septic)
 - 149 Other accidents of childbirth:
 - (a) Caesarean operation
 - (b) Others
 - 150 Other and unspecified conditions of the puerperal state

* Maternal Mortality in New York City, *Weekly Bull.*, Dept. of Health, City of New York, Dec. 13, 1930.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

Concerted Action in Baltimore— According to the standard curriculum, public health lectures to student nurses constitute a required course in Maryland and have to be given by persons experienced in public health work. In 1925 the superintendents of 14 hospitals conducting nursing schools in Baltimore were invited to try out a plan to send all their nurses to one central gathering place where one series of public health lectures could be given to all, saving time and money which might otherwise have been expended in getting lecturers for each of the 14 hospitals.

In the fall of 1925 the first course, arranged by the Baltimore Health Department, was given. It consisted of 10 lectures given by officials chosen from the city health department, the Johns Hopkins School of Hygiene and the Maryland State Department of Health. Ten of the 14 schools invited sent their pupil nurses to these lectures and examinations were given at each hospital at the completion of the course.

The following year student nurses from all 14 hospitals participated, the lectures were increased to 12 hours, and a demonstration visit to the city health department was given. One college credit was given for this 15 hours' work.

The enrollment of nurses increased from 214 from 10 hospitals in 1925 to 356 nurses from 13 hospitals in 1930. (One hospital had closed after 1927.)

The conducting of these lectures is desirable not only because the lectures enable the hospital training schools to meet the standard re-

quirements but because they will in the course of time give all of the graduate nurses trained in the city a better knowledge of preventive medicine and an interest in the health work of the community.—

V. L. Ellicott, M.D., *Baltimore Health News*, Dec., 1930, p. 78.

The Teacher's Morning Inspection in Communicable Disease Control—The school nurse has come to realize more and more the important rôle routine morning inspections play in preventing the spread of communicable disease in her schools. In many instances, she is fortunate enough to have the classroom teacher assume this responsibility, and as a rule the results are most gratifying.

However, how well equipped is our average school teacher to detect symptoms of a communicable disease? A field supervisor in Indiana had a very enlightening experience a few weeks ago. A city school nurse was very much concerned because of a threatened scarlet fever epidemic in one of her schools. Upon inquiry, the supervisor learned that the teachers were giving daily inspections in order to weed out suspicious cases. Fine! but to her great surprise she found that one teacher's idea of symptoms of scarlet fever was "peeling hands and chest"—and every morning she diligently searched for "peeling hands." The school nurse was just as surprised as the supervisor; she had been quite sure that the teachers knew what to look for.

The average lay person has very little, if any, scientific knowledge of communicable diseases and it is up to us as

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 126 State House Annex, Indianapolis, Ind.

public health nurses to spread the light of the essential facts, at least, to as many people as we can. That is part of our preventive program. The majority of teachers are interested in the more commonly known communicable diseases and they will show great interest in the particular disease one of their own pupils may have developed. So—at least while the iron is hot, we should strike. If there is a case of scarlet fever, diphtheria or measles in our schools we should use that unfortunate incident as a golden opportunity to inform the teachers how scarlet fever, diphtheria or measles is spread. We should give a “demonstration inspection”—pointing out some of the definite symptoms—if there are any; and a talk to the students—whether in the 1st or 12th grade—should help the children and grown ups, too, toward developing a more sane and intelligent attitude toward the dreaded “catching sicknesses.”—Henrietta Landau.

A Census of Nurses in Industry—
In 1928 the National Organization for Public Health Nursing sent questionnaires to 2,200 industrial establishments located in all but 7 states of this country and in Hawaii. Information was received from 1,006 of these establishments employing 2,022 nurses. The following are some of the facts obtained:

1. The number of employees in the 24 different types of industrial and commercial concerns ranged from fewer than 250 to more than 10,000.

2. Eighty-five per cent of the total 2,022 nurses were registered nurses.

3. Practical nurses were found in 5 per cent of the establishments reporting, most of which had fewer than 1,000 employees.

4. Only 4 per cent of the total number of nurses were employed part time.

5. Establishments having 2,000 or more employees tended to employ full-time physicians, while those having 1,000 employees or fewer usually had physicians on call.

6. The great majority of nurses in half the establishments were professionally responsible to a physician.

7. The nurses in less than one-third of the establishments had standing orders.

8. Three-fifths of the establishments had nurses working inside only; some had nurses who visited the homes of employees, also.

9. Practically all the nurses gave emergency treatment of injuries and sickness. In descending order of frequency they gave the following services: (1) assisting the doctor in physical examinations, (2) health instruction to employees, (3) participation in safety program, (4) sanitary inspection of plant, (5) nurse examination (inspection) of employees, (6) assisting the dentist.

Routine visiting of absentee employees, usually those known or suspected to be sick, was the most common service rendered in the home.

In some establishments nurses gave health instruction in employees' families.

Comparative working hours of public health nurses:

Health Departments.....	44.7 hours per week
Boards of Education.....	39.7 hours per week
Public Health Nursing	
Associations	47.3 hours per week
Industrial and Commercial Concerns	48.8 hours per week

Louise M. Tattershall, Nurses in Commerce and Industry, *Pub. Health Nurse*, XXII, 12: 636-637 (Dec.), 1930.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Are You "First" in Anything?—It is worth while to dig out the facts about the rank of your city or state in any phase of public health, especially if you have first place or even second or third; and then to check up to see if you have kept in the van of those who followed your wise example. You can use this information in writing and speaking, when timely, and in planning an anniversary or award of honor.

In *Better Times*, 151 Fifth Ave., New York, N. Y. (Jan. 5, 1931), a correspondent names the following "firsts" for Massachusetts: State Board of Health, State Tuberculosis Hospital, Clinics for Detection of Tuberculosis in School Children, State Cancer Hospital, State Mental Hygiene Clinics, State Hospital School of Crippled Children, State Requirement for Medical Inspection of School Children.

"The Foe of Youth"—This will be the theme of the "Early Diagnosis Campaign" by tuberculosis and other participating health organizations during April, 1931. Better and better is the assortment of about 30 items of campaign material, descriptions or samples of which will be supplied by the various state tuberculosis associations, or the National Tuberculosis Association, 370 7th Ave., New York, N. Y. Folders, booklets, posters, lantern slides, motion pictures (standard and narrow gauge), and electrotypes are offered, in addition to considerable national pub-

licity. Especially good are the two-color letterhead and the 8-page pamphlet on "Laennec the Listener," the story of the stethoscope and its inventor.

It is a campaign for and by health departments and other health agencies, backed by many types of non-health organizations. The campaign is focused by tuberculosis groups which have created the opportunity.

Should not every health agency scrutinize carefully the material and plans to determine its own share in this opportunity?

Getting Together on Health Education—In 14 cities and states there are social work publicity councils. All of them include groups of health workers. In a score of cities there are small groups of members of the Public Health Education Section.

Why not a get-together session? Is there not enough material—are there not enough topics—in this issue of the *Journal* to talk about? Try it just once.

For further suggestions write to the editor.

"Keeping Up with the Joneses"
Who Edit Magazines—"It takes all the running you can do to keep in the same place," is quoted by Arthur Dunham in a spritely article on "The Social Worker and the Scissors" in *Better Times*, 151 5th Ave., New York, N. Y., Jan. 5, 1931. 30 cents. Please substitute "public health" for social work in the following:

Books and monographs relating to social work now pour forth in an unceasing stream.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

But there is one substantial satisfaction about any given book or monograph: generally speaking, there is only one of it!

Not so with the social work periodicals. Finish one issue and lay it aside with a sigh of virtuous satisfaction; the next blast that sweeps from New York brings to your table a new issue, and two other magazines which you had for the moment forgotten.

Allow two successive issues of the same magazine to lie unread and your doom is all but sealed. You lose out on current news. . . . You hear nought of new experiments (called "demonstrations") and new developments in your own field; you smile vaguely and feel inferior when an irritatingly well-read colleague or an omniscient out-of-town speaker alludes airily to that intriguing article in the current issue of *The Social Worker's Companion*. And all the while your stacks of magazines, like the reports described by Walter Lippmann, mount higher and grow mellow and more mellow on your own desk.

. . . There are, however, a few practical suggestions which, if consistently followed, may give the social worker at least a sporting chance of holding his own in the magazine marathon. Here are the suggestions:

1. Put magazine reading into your program. If you haven't a program, read Arnold Bennett's "How to Live on Twenty-Four Hours a Day," and try making one. Magazine reading takes time—just like interviews, "conferences," bridge, and detective stories. . . .

2. Limit your aims. You can't read everything that is written on social work. The most you can hope to do is: (1) to keep up technically and thoroughly with one specialized field of social work—two fields at the most; (2) to maintain an intelligent "current events" or background knowledge of the progress of social work as a whole.

3. Select your magazines with these aims in mind. . . .

4. Develop a technic of reviewing periodicals. Cultivate the art of skimming the unimportant and concentrating on the important. Abbe Dimmet, in *The Art of Thinking*, has charmingly told "how to read the newspaper":

"Others again—few in number—armed with a red pencil and big scissors sit beside a pile of newspapers which they treat unceremoniously indeed. Half the sheets are flung aside while the rest are eagerly but quickly gone over, the red pencil every now and then zigzagging through a column. In less than an hour the seven or eight newspapers have been gone through and the red-marked pages alone strew the table, sofa and piano.

Then the big scissors come into play."

5. Clip your magazines. Generally speaking, the idea of keeping a complete file of a magazine is a delusion and a snare for an individual. . . .

Clipping is infinitely simpler and more satisfactory. Mark the articles which you want to clip, while you are reviewing the magazine. Select for clipping articles which you will probably want to refer to again, because of their permanent value or their importance to your job.

6. Identify your clippings. Write the name of the magazine (abbreviated) and the date of the issue on each clipping. . . .

We are promised an article on filing clippings by Mr. Dunham, but in the meantime would like to hear how some of our readers manage this job.

From the Outside in—Is there a hidden "moral" here for public health workers?

Never before in modern business have merchants become so keenly aware of the fact that the customer is king. Stock is bought, windows trimmed, interiors arranged, salespeople hired and fired, merchandising plans made—all with one eye on the buying public. It is because merchants frankly acknowledge today that they must run their stores from the outside in, rather than from the inside out—that it has become more necessary than ever before to have an accurate and complete close-up view of the buying public.

"Study Your Customers," by Ruth Leigh, *Publishers' Weekly*, Sept. 6, 1930, p. 915.

What Do You Want at Montreal?—Early in January the Council of the Public Health Education Section will meet to plan for the Montreal program and for any possible Section activities before the October convention.

What do you want? Or object to? Or what do you suggest for consideration? Please write to any Section Council member, or to the editor.

The New Mother's Day—A new meaning is to be given Mother's Day, this coming May 10. National pub-

licity emphasizing the high maternity death rate in the United States will precede May 10, according to the Maternity Center Association, 578 Madison Ave., New York, N. Y.

Another Campaign Opportunity— More than 7,000 communities participated in the 1930 Better Homes Week. How sanitation and health will secure recognition in the 1931 campaign is largely up to the health agencies. April 26–May 2 is the 1931 date. Better Homes in America, 1653 Pennsylvania Ave., Washington, D. C., will supply the needed information.

MAGAZINE ARTICLES

Popular articles on disease and health appear in a wide range of periodicals. Professional public health contributions from Dr. Louis I. Dublin and Dr. James A. Tobey have appeared frequently in magazines of general circulation. Doubtless more articles from A. P. H. A. members would be welcomed by editors.

Editors of health department or association bulletins or house organs could do much worse than to quote liberally from many of the published articles listed in this department.

In many cases permission would be given to make quotations to be supplied to factory and office employees' bulletins and other local publications.

"Birth Control and the Moral Law," by Dean Inge. *Atlantic*. Dec., 1930.

"The Common Cold," by Hugh S. Cumming. *Journal*, National Education Assn., Washington, D. C. Nov., 1930.

"For a New Year of Health," by G. F. Alsop. *Woman's Journal*, 171 Madison Ave., New York, N. Y. Jan., 1931. 25 cents.

"Lady Doctor of the Helderbergs," by J. P. Gavit. *Survey Graphic*, 112 East 19th St., New York, N. Y. Dec., 1930. 30 cents. Baby welfare and

medical service in a New York backwoods section.

"Mental Health at Moderate Cost," by Mary Ross. *Survey*. Nov. 15, 1930. 30 cents. Hospital psychiatric service in terms of "Mr. Thompson."

"New Theory of Tooth Decay," quoting Dr. C. F. Bodecker of Columbia University. *Literary Digest*. Jan. 3, 1931.

"Our Menacing Toll of Accidents Attains a New Peak," by Louis I. Dublin. *New York Times*. Dec. 1, 1930. "100,000 deaths our tribute in 1930."

"Science's War for Humanity," by Dr. Francis Carter Wood. *New York Herald-Tribune Magazine*. Dec. 14, 1930.

"When Doctors Disagreed," by J. P. Murphy. *Survey*, 112 East 19th St., New York, N. Y. Dec. 15, 1930. 30 cents. Sympathetic but critical appraisal of the White House Conference.

PUBLIC SPEAKING

Some topics for health talks: "Why Insist on Dying of Cancer?"; "How to Be Happily Born" (prenatal care); "The Sneak and the Mimic" (syphilis); "Patrick, it's bedtime!" ("the unrested child"); "The 'Don't' Mother and the 'Won't' Child" ("insidious parental habits"); "Are You Paid Too Much?" ("economic value of fitness through games and sport"); "Ringworms Round Rosie" ("and other skin troubles in childhood"); "Zulu Beauty Culture" ("has it a place in Canadian civilization?"); "Diphtheria the Outlaw" ("in Germany a death from diphtheria entails legal action against those responsible"); "Growing Pains" ("a stop-look-listen sign: acute pain in or near a joint may be very serious"); "Tremendous Trifles" ("the small, trivial injury"). The above come from the newly organized Greater Vancouver Health League, a branch of Canadian Social Hygiene

Council. From the Winnipeg branch come these titles: "Our Grandmothers as Physicians"; "Therapeutics of the Bible."

NEW

"The Sight-Saving Review," National Society for the Prevention of Blindness, 370 7th Ave., New York, N. Y. First quarterly issue in March.

Designed to meet the needs of state and local prevention of blindness workers, educators, illuminating engineers, school physicians and nurses, safety engineers, public health administrators, industrial physicians and nurses, sight saving class teachers and supervisors, ophthalmologists, and anyone interested in the sociologic phases of saving sight.

The 80 pages will contain original articles, abstracts from current periodicals throughout the world, book reviews, and reports of the Society's activities.

\$3.00 a year. Samples free. The *News Letter on Sight Conservation* will be continued in reduced form and more popular content.

LISTS

Nurses holding executive positions in states, and officers of state public health nursing organizations. *Public Health Nurse*. Jan., 1931.

Whole-Time County Health Officers. *Public Health Reports*. Dec. 19, 1930. Supt. of Documents, Washington, D. C. 5 cents.

VOLUNTEERS

All types of health agencies will be interested in "Volunteer Service for Public Health Nursing Organizations" in *Public Health Nurse*, 370 7th Ave., New York, N. Y. Jan., 1931. 35 cents.

During the fall of 1930, questionnaires were sent by the National Organization for Public Health Nursing to a group of urban public health nursing associations, county health organizations, city health departments, and to school boards, requesting information as to the services which volunteers were rendering. The replies are summarized here, rather in-

formally, and a few general principles deduced from the experiences reported.

In this study, a volunteer job is defined as one that would call for the work, other than nursing, of a paid member of the staff, or the paid work of an outsider, if the volunteer did not do it. The service offered by officers and board members of the organization incident to their positions as administrators is not included.

The replies cover types of service, how recruited, where volunteers come from, training, supervision, advantages and disadvantages. This department is interested because of the potential publicity value of every volunteer. Outside of campaigns few health agencies have discovered the varied publicity services possible through volunteers.

In November a 3-day institute in New York City was attended by 200 board members of nursing organizations from 50 cities in 9 states!

PICTURES WANTED

Our hygiene class is studying the lives of various heroes of health. We are also making a scrapbook in which we would like to put the pictures of these great men. . . .

Could you help us?

The following are the men about whom we are studying:

Jenner	Lister
W. Reed	Wm. Roentgen
Pasteur	Robert Koch
Grenfell	Ser. F. Branting
Theobald Smith	Florence Nightingale
Alexis Carrel	

If you have pictures of others we would appreciate having them.

The New York Academy of Medicine, 2 East 103d St., New York, N. Y., will supply 5 x 7 photographs of the above at \$1.25 each. Photostats \$.25 to \$.50 each.

Are there any better portraits obtainable, and at less cost?

Will an insurance company or some one else provide a *printed* set of portraits for school use?

WHY DO THEY DO IT?

A memorandum of health activities in a city, located east or west of Montauk Point, is headed

A Review of New Activities initiated or accomplished at . . . during the past ten months.

But the memorandum is not dated! Nothing but a real letter is dated—according to the average stenographic mind. The way to avoid trouble in filing and sending out undated material is to have an office rule that *all material* going through a typewriter shall be dated *unless* contrary instructions are issued.

A 4-page T.A.T. folder of special merit is issued by "the Health Department" in some unnamed city. Why the modesty?

REPORTING

"Pursuing Health with one of Henry's Fords" is the cover-page statement, and "or a Day with one of the Dutchess County's Public Health Nurses" is the sub-title across the inside flap of the gaily illustrated folder. It tells all the average person could wish to know about the public health nurse. Paper, typography and layout are way above the average. Dutchess County Health Assn., 16 Cannon St., Poughkeepsie, N. Y. 2 cents.

On the afternoon of December 31, 1930, Health Commissioner Shirley W. Wynne submitted to the Mayor of New York City an 11-page summary report of department activities for 1930. Nearly 200 radio talks were delivered. "More space has been given (in the newspapers) to public health and to the education of the public in health matters than ever before." Of special interest is the war on quacks:

Renewed widespread activities of medical quacks, charlatans and peddlers of questionable nostrums caused the department to take definite action against this menace to health

during 1930. The department made a special appeal to the Federal Radio Commission for assistance in barring these quacks from the use of the air.

As a further aid and safeguard in this campaign, the department, through the assistance of the National Better Business Bureau, has been able to compile what the press has called "The Medical Rogues Gallery," in which upwards of 25,000 names and addresses of quacks, charlatans and manufacturers and peddlers of nostrums have been alphabetically arranged. This is the first time any Department of Health has taken such a step and the directory, it is expected, will form the nucleus of a national gallery in the very near future. When this is completed, any radio broadcasting station can obtain a complete history of any quack who applies for time on the air.

"In Which The Public Health Federation Reports" is the non-report looking cover-title of the 1930 report of the Public Health Federation, 312 West 9th St., Cincinnati, O. Including its brief mention of city, county and state health departments the report offers a cross-section of the diverse health activities of a large city. The newest of the councils within the Federation, the Health Education Council, is explained:

It is made up of physicians, dentists, nurses, health educators and lay people representing public and private health organizations interested in health education, and of general publicity and advertising experts.

The purposes of the council are to coördinate the health education activities of private health agencies, to render such assistance as possible to public health departments, to advise and assist in conducting health education campaigns and programs, to endeavor to prevent overlapping and duplication of health education activities in Cincinnati and Hamilton County.

"Our famous Paul Revere was the first chairman of Boston's Board of Health, and the country's first State Board of Health was established in Massachusetts in 1869."—This the opening paragraph of a leaflet contributed by Massachusetts Dept. of Public Health, Boston, to the Massachusetts Bay Tercentenary. 2 cents.

In *Public Health News*, New Jersey Dept. of Health (Oct.-Nov., 1930), appears "The Year in Review"—tells how "Education Is Often An Indirect Achievement" and that "Education Accomplished by Many Activities."

Transition from policeman to teacher has affected both the work and point of view of health officials. So true is this that nearly every activity of the State Department of Health attempts more or less directly to instruct, interest and lead local officials and citizens to do the right thing for their own well-being and that of their neighbors.

MOTION PICTURES

The Amateur Cinema Club of Toronto, Canada, has been providing amateur movie programs for the patients of Christie Hospital.

American Cancer Society is booking a new picture (both 16 mm. and 35 mm.) of both living normal and cancer cells.

"Clara Cleans Her Teeth," a new film on dental hygiene in 16 mm. narrow gauge stock, is being distributed by New York State Dept. of Health.

Five simple rules for the writing of captions—in "Recipes for Titles," by A. L. Gale. *Movie Makers*, 105 West 40th St., New York, N. Y. Jan., 1931. 25 cents.

Did you see the Red Cross Roll Call "talkie"? A trailer of 150 feet of "action-filled film." Sold at \$15.00. \$7.50 for the silent version.

Exceptional was the procedure of the National Society for the Prevention of Blindness in asking for outside criticism and counsel on a new picture recently. Before the final continuity was decided the picture was assembled and submitted.

To keep in touch with motion picture thought and developments around the world consult *International Review of*

Educational Cinematography, 1-A Via Lazzaro Spallanzani, Rome, Italy. The English edition should be available in large public libraries. For a classified table of contents showing numerous references to health and hygiene send a stamped and addressed envelope to this department.

On the market: a portable sound movie outfit with hand-microphone. You can add the "talkie" to a "silent"; or double with a "talkie." For address write *Movie Makers*, 105 West 40th St., New York, N. Y.

HONORABLE MENTION

To Indiana Tuberculosis Commission: for annual report not looking like an official state report (but the paper did not need to shine).

To Attleboro, Mass., Health Department: for the prominence given to "Health Education and Publicity" in an annual report.

A REQUEST FROM INDIA

Will you send some material? If convenient please tell the editor that you have done so.

For the benefit of health workers and others we are planning to have occasional exhibitions, showing the aims and objects and the type and extent of health education and practical work that is being carried out or has already been accomplished by the big organizations of the world.

May I request the favour of your very kindly helping in the matter by sending this office such literature and other material as you may be able to spare and which may serve the object.

Statistical charts, specimen propaganda literature, in way of booklets, pamphlets, bulletins, posters, pictures, etc., including an annual report, will be highly appreciated.

Hoping to be obliged at an early date.

Signed by Harnath Singh, D.P.H., Publicity Officer, Public Health Department, Punjab, Lahore, India.

BOOKS AND REPORTS

On the State of the Public Health
—*Annual Report of the Chief Medical Officer of the Ministry of Health for the Year 1929*—By Sir George Newman. London: His Majesty's Stationery Office, 1929. Price, 3s., 6d.

It is safe to say that there are no more enlightening documents on public health than those written by Sir George Newman, Chief Medical Officer of the Ministry of Health of England. While they discuss affairs which belong to that country, they are none the less enlightening and useful to those interested in public health in every part of the world.

Some English reviewers point out that the present volume is not as optimistic as usual and confess that 1929 was a bad year, with happenings calculated to give grave anxiety to the health authorities. While we cannot entirely agree with this, the report does point out certain evil tendencies and gives warnings which should be heeded.

It has been evident for some years that both birth and death rates were declining, the proportion of children decreasing, and those past the prime of life increasing, the result being that the average age is steadily rising, making the ratio of deaths to population more unfavorable than formerly. In England the natural increase in population, which was 5 per 1,000 in 1928, was only 2.9 in 1929, indicating one more step toward a stationary population.

The total number of deaths showed an increase of 72,103 over 1928, with a rate of 13.4 per 1,000. Of these, 34.91 per cent occurred under the age of 50; the death rate of infants under 1 year was 74 per 1,000 births. Sixty-four per cent of the total death rate was due to: (i) diseases of the heart

and circulation (225 per 1,000 deaths); (ii) bronchitis, pneumonia, and other respiratory diseases (157); (iii) cancer (107); (iv) diseases of the nervous system (82); (v) all forms of tuberculosis (71). It will be noted that cancer ranked third as a cause of death, the rate being higher than that recorded in any previous year.

Practically every subject which would interest those concerned in public health is treated in order, and the entire report reads more like that of an institute for research than a bare statement of figures such as we usually expect from a board of health. Considerable space is given to education, the author laying stress on the educational value of the development and extension of sanitation, believing that they have a far-reaching effect in developing the "will for health," holding also that, far from decreasing voluntary efforts, it has increased them. Both scientific and popular bodies, as well as such movements as the Boy Scout, the Woman's Institute, Industrial Welfare, etc., show great activity. A note of warning is sounded against "an orgy of public effort or public demand of doing something for everybody," since this may lead to a decrease in the sense of individual responsibility, and the necessity of people doing something for themselves.

This report is commended to all health officers and others interested in public health as a document which stands preëminent. M. P. RAVENEL

Treatment of Epilepsy—By Fritz B. Talbot, M.D. New York: Macmillan, 1930. 308 pp. Price, \$4.00.

The current opinion of a number of school health administrators is that epi-

lepsy is on the increase among school children. Whether this is a real or only apparent increase, it is difficult to decide. It may arise from the change which has been taking place in our conception of epilepsy from that of definite disease entity to a symptom complex, resulting from a number of causes. This is clearly pointed out in Talbot's recent book where he takes up in order all the possible etiological factors and their interrelations. The pathology, diagnosis and cardinal symptoms of each type of the syndrome are concisely stated.

Talbot is perfectly correct in his statement that, "although by far the majority of subjects are adults, epilepsy should be considered a disorder of childhood and youth because it most often begins during the early years of life."

Considerable attention is given to the dietary treatment of epilepsy, which the author feels is of great value. A thorough discussion of the Ketogenic Diet from both a theoretic and practical basis takes up the major part of the volume. An excellent bibliography is provided. The format of the book is up to the usual standard of excellence of the publishers.

R. A. BOLT

The Book of My Life (De Vita Propria Liber)—*By Jerome Cardan. Translated from the Latin by Jean Stoner. New York: Dutton, 1931. 331 pp. Price, \$3.50.*

All who are interested in history owe a debt of gratitude to the translator for this English version of the autobiography of that remarkable man, Girolamo Cardano, known to the English world as Jerome Cardan, who has been described as "sensitive, affectionate, introspective, imaginative, superstitious, humorous, inclined to ideas of self-reproach, with high ambition and hypomaniac industry," and also "the wisest fool and the most foolish wise man of his time." He was skilled in

gambling, music and fishing, but most expert in gambling, having paid his way at Padua by the practice of this art, though he wrote an excellent book advising against it, but giving instruction in it.

He was born at Pavia, September 24, 1501, and died at Rome, September 20, 1576. Fate seems to have been against Cardan. His parents lived apart and his mother tried to destroy him in infancy, while his father maltreated him. It was not until he was 19 years old that he began to receive ordinary instruction in the gymnasium, but in two years he had become so much a master of medicine, mathematics, and philosophy that he was able to discuss these subjects publicly. In his 23d year he went to Padua, was graduated a year later, practised in small towns with some success, and, approximately 10 years later, was called as Professor to Milan. He was 39 years old before he overcame his early handicaps, became prosperous, and lived in some comfort. Later he became perhaps the most famous physician of his time and received many honors at home and abroad.

His has been described as one of the three great autobiographies in literature. It is an interesting document from every standpoint. It has been abused by some, but praised by many of the great men of the 17th and 18th centuries. He is regarded by many as having been the first to show what we now call the scientific spirit, and to have originated the "new order" which was to change the face of the universe."

It is hard to give a fair analysis of his ideas. We must remember his background and the times in which he lived. He believed in astrology and omens, yet was one of the great mathematicians of his time, and responsible for introducing algebra into the schools of Europe. He subjected himself to pitiless analysis

on the one hand, and showed conceit on the other, having recorded a list of 73 illustrious men who gave testimony concerning him. He wrote a number of books on mathematics, astronomy, physics, morals, medicine and divination. He believed in guardian angels, one of whom, he said, attended him for much of his life, though not recognized until the 74th year of his life.

From our standpoint, one of the most interesting chapters is that on his successes in practice, particularly the cure of John Hamilton, Archbishop of St. Andrew's, who for 10 years had suffered from asthma which all physicians had failed to relieve. Cardan prescribed rules for living, among which was the discarding of a feather bed and the use of a linen pillow. The Archbishop improved so rapidly that one cannot help wondering whether he was not hypersensitive to feathers, and if we have not here probably the first case on record of the cure of an allergic disease.

It is impossible to give a fair idea of this book within the limitations of an ordinary review. It must be read to be appreciated. The translator has done an excellent piece of work. Thirty pages of notes explain references and give brief sketches of the many persons mentioned in the text. The printing, illustrations and make-up of the book are all that can be asked.

M. P. RAVENEL

Studies of the Efficiency of Water Purification Processes—IV. Report on a Collective Survey of the Efficiency of a Selected Group of Municipal Water Purification Plants Located Along the Great Lakes. Public Health Bulletin No. 193—By Sanitary Engineer H. W. Streeter. Washington: U. S. Public Health Service, November, 1929. 100 pp.

This bulletin deals with the efficiency of municipal water-purification systems located along the Great Lakes, from

which approximately 10,000,000 people derive their water supply and into which the sewage and industrial waste of about five and one-half million population are discharged. The report is based on a survey of 14 representative municipal water filtration plants situated on the Great Lakes and connecting waterways, including the plants of Detroit and Cleveland. The survey, which was made at the joint request of interested local and State authorities, was an extension of previous surveys of a similar nature made along the Ohio and other rivers of the Middle Western and Eastern States.

Owing to the great importance of the Great Lakes region from standpoints of population, commerce, and industry, the maintenance of safe water supplies along these Lakes constitutes one of the major water-purification problems of the country. With the increasing pollution of sources of water supply located in various marginal zones of the Lakes, this problem is becoming a more difficult one each year, taxing at present, in some instances, the resources of modern water purification.

The difficulties of obtaining safe purified water supplies from the Great Lakes are magnified considerably by the extreme variability existing in conditions of pollution of the lake waters at the several water intakes, which are located in or close to marginal zones of shore pollution, where water movements are subject to the vagaries of winds and countercurrents. In some instances the pollution of these zones probably is subject to seasonal variation, due to large increases in the sewered population residing along the Lakes during the summer vacation season.

A study of the performance of the 14 Great Lakes plants included in the survey revealed some interesting similarities and contrasts in the behavior of these plants, both among themselves and in comparison with purification

systems of the Ohio type. Perhaps the most striking similarity observed was the existence, at practically every plant, of a well defined relationship between the bacterial quality of the raw water, as delivered for treatment, and the corresponding quality of the effluent produced at each successive stage of purification. This same relationship, which is one of fundamental importance, had been noted previously in studies of water purification on the Ohio River and on other rivers.

The most important dissimilarity observed was the marked variability in average bacterial efficiency shown by the several Great Lakes plants among themselves and their disparity in this respect from Ohio River plants of the same general type. Among the Great Lakes plants, divergences in efficiency were indicated as being due in some cases to differences in the average density of raw water pollution and in certain features of plant design and operation. In other instances no reason could be assigned for the inequalities noted.

As regards the comparative bacterial efficiency of the Great Lakes and the Ohio River plants, the former were shown consistently to be slightly less efficient with chlorination included, and decidedly less efficient with chlorination excluded, than the latter group. Detailed analyses of the data failed to disclose the reason for these divergences, which do not appear to be explained as currently assumed, by the relatively lower turbidity of Great Lakes water. It is suggested that they possibly may be due to differences in the chemical composition of the two waters, notably in the hydrogen-ion concentration.

From a study of the relationships observed between the bacterial qualities of the raw waters and effluents of the Great Lakes plants, and from an analysis of their variations, it was concluded, in so far as the production of final ef-

fluents conforming to the revised Treasury Department *B. coli* standard is concerned, that an average density of *B. coli* in Great Lakes raw waters, as delivered for purification, approximating an index of 4,500 per 100 cubic centimeters, appears to represent an upper limit of permissible pollution, beyond which a majority of the Great Lakes filtration plants, as at present designed and operated, would be clearly overburdened. Mean densities ranging from 1,000 to 4,500 per 100 cubic centimeters represent a doubtful zone, within which some plants might be and others might not be overburdened for a significantly large proportion of the time. With average densities ranging below 1,000 per 100 cubic centimeters, the majority of such plants would not be expected to be overburdened except for a comparatively small proportion of the time.

Among the areas studied, the most highly polluted zone of the Great Lakes from which water is taken for purification was located at the extreme southern end of Lake Michigan, where existing purification systems are clearly overburdened. Other zones of relatively high, though not in all cases excessive, pollution were found to be at the extreme western end of Lake Erie, at the outlet of the Detroit River, and along the southern shore of Lake Erie between Cleveland and Sandusky.

H. W. STREETER

Medizin, Gymnastik und Pädagogik im Kampfe gegen die Tuberculose Harmonische Behandlung—By Prof. Dr. Eugen Kisch. Leipzig, Verlag Georg Thieme, 1930. 83 pp., 83 figs. Price, 5.90 Marks; bound, 7.30 Marks.

Dr. Kisch, medical director of the Institute for Bone and Joint Diseases of the city of Berlin and of the Tuberculosis Sanatorium in Hohenlychen, gives the technic and results of heliotherapy

as applied by him in the treatment of tuberculosis of the bones and joints. In the preface Professor A. Bier bewails the fact that the idea is prevalent that it seems to be more important to heal the sick of their diseases than to keep well persons from becoming sick, and cites the experience during the war of the ill effects of prolonged hospitalization upon even the best of the soldiers.

In his sanatorium practice Dr. Kisch uses largely the outdoor life and physical activity favorable for the healthy in his restoration of the tuberculous children to health, but directs, supplements, and extends the exposure of the body at all seasons of the year to the direct action of the sun's rays. It is his contention that it is the heat rays rather than the chemical rays which are most effective. They induce up to a sevenfold increase in local circulatory activity, and the hyperemia continues for several hours after the cessation of the exposure.

Gymnastic exercises, sports and work suited to patients are utilized in connection with exposure of the body. Typical schedules of exposure times and regions of the body are cited and the indications for treatment are discussed. Results of this treatment are tabulated and particular cases illustrated fully by photographs and roentgenographs. These indicate a high degree of success.

C. A. KORFID

Eat and Keep Fit—By *Lyman F. Kebler, M.D., M.S.* Washington, D. C., 1322 Park Road: *Lyman F. Kebler*, 1930. 302 pp. Price, \$3.00.

The author was the late Dr. Wiley's right-hand man for many years and did the medical and chemical work for the postal authorities, the governmental agency which has helped more than any other, and perhaps more than all others put together, in putting fraudulent food manufacturers and advertisers out of business. He therefore has had an

enormous experience in his special line and is well prepared to write on his specialty.

In addition to many standard tables which are found in works on physiology and foods, the book contains a large number of diets and menus, and if followed, the advice given will doubtless serve a good purpose. Fortunately, the craze for the boyish figure shows signs of abatement. Those who really suffer from overweight and wish to reduce can do so without impairing their health by following the recommendations given.

Unfortunately, as we believe, the author recommends some foods which are not entirely free of the charge of being quack remedies. Certainly the advertisements concerning them are open to this charge.

There is an introduction by Dr. Wiley, who opposed food quackery of every sort, and mentioned particularly one of the breads which the author has assisted in advertising and which he mentions in this book. It is a pity that such a good book is marred by this defect.

M. P. RAVENEL

Sterblichkeit und Todesursachen in den Kinderjahren—*Eine Sozialhygienische Untersuchung in den vier grössten Städten Schwedens*—By *Einar Rietz*. Upsala, 1930. In *Acta Paediatrica*. Vol. IX, Suppl. III. 175 pp., 27 figs. in text.

This study is based on the vital statistics of four Swedish cities, Stockholm, Gothenburg, Malmö, and Norrköping, with a combined population in 1927 of 874,733 inhabitants and a total of 23,953 deaths in the ages of 0-15 years between 1913-1927 out of 200,889 births.

The results indicate that the infant mortality of the first month is increased and the distribution of the causes of death in that period is modified by maternal [hereditary would be better]

chemistry and experimental physiology, treating the facts of individual case situations, have produced the real advances in preventive medicine.

Save for Budd's statistical investigation of typhoid fever (*circa* 1859), Ross's investigation of malaria (1899 *circa*), Farr's inquiries into cholera (*circa* 1854), little light has been thrown on the proximate-causal factors of disease by statisticians; at least, medical statistics, dealing with aggregates of human beings, have not initiated in any important respect any steps leading to specific and dependable preventive measures. Nor has it been established to the satisfaction of wholesomely sceptical persons that statistics can serve more than superficially in the movement for connecting preventive work as cause with reduced sickness and mortality as effect.

The present work is divided into three major sections: I. Births; II. Human Constitution, Heredity, Defects and Impairments; III. Sickness and Injuries. Under "births," Dr. Prinzing discusses birth statistics as ordinarily understood, legitimate fecundity and the size of families (distinguished from the concept of "fertility"), sterility, miscarriages and abortions, still-births, multiple births, the sex-ratio at birth, and the puerperal state.

Prinzing apparently conceives vital statistics registration to be primarily a function of the administrative-legal branch of government (as it is and has been in Massachusetts since 1631), rather than that of the administrative-public health branch. Vital statistics may quite properly be regarded as a safeguard for human rights in general and not exclusively as a basis for the enforcement of the right to health, however important that may be.

In the "constitution" group (Title II) we find a full classification of medical anthropometry, and also a good discussion of heredity on the pathological

side. A summary of the statistical methods and sources on blindness, the deaf and dumb, mental defect, cretinism and various crippling disabilities closes this section. The third "title" in the text discusses morbidity statistics in general, the resources in insurance medical statistics, occupational diseases, injuries in general, mental diseases, venereal diseases, alcoholism and long-term disabilities. The second volume of the text will deal with mortality statistics. We may expect this latter book to appear late in 1930. An English translation would be of service to American students of medical statistics.

E. W. KOPF

Recording and Reporting for Child Guidance Clinics—By Mary Augusta Clark. *New York: The Commonwealth Fund, Division of Publications, 1930.*

This masterly presentation of a most difficult subject is the result of painstaking effort expended over a period of years. The details of service bookkeeping described and recommended represent an evolution of procedure and practice in various clinics throughout this country.

As one who has seen much of the work in manuscript and had occasion to put the instructions into practice, the commentator can testify to the usefulness and practicality of the work. While superficially the details may seem overwhelming almost to the point of confusion, in actual practice one finds that the wording is unusually clear and the principles well defined. If the book is used as it was intended, namely as a guide in establishing a basic procedure, it will be found that the forms and numerous outlines lend themselves to more adaptation than is at first apparent. To one interested primarily in so-called clinical procedures and the individual who comes for treatment, recording and

reporting of statistics is likely to seem something of a burden.

The actual labor involved is much simplified when one has such a guide to help in discriminating between what is likely to prove interesting and instructive and what is relatively less essential. Not the least valuable aspect of such a system is that, since the main body of the outline is used by such a large number of the psychiatric clinics throughout the country, there is furnished a basis for comparison which is very helpful in the discussion of problems of mutual interest between various organizations engaged in child guidance.

The book is exceptionally technical and not deemed to be of popular interest, nor for popular consideration.

The use of the term "sibling" as defined on page 68 is still open to serious question. Although that may appear a convenient definition for use on the case data cards, it is likely to lead to confusion if the word is used in the same sense in the body of the social history, where the name of the patient should be entered in its proper sequence among the other siblings. However, that is a minor point and in no way affects the value of the book.

This publication appears particularly timely when the organization of new child guidance clinics in various localities is so much in the air, and it should without doubt head the list of reference works in any library.

HELEN P. LANGNER

Memories and Vagaries—By Axel Munthe. New York: Dutton, 1930. 257 pp. Price, \$3.00.

The tremendous success of *The Story of San Michele* has brought about the republication of this book which first appeared in London in 1898. It has had great success, having gone through 12 printings in one month. It is a collection of unconnected short stories, many of which are in the author's best

style, while others are disappointing when compared with *The Story of San Michele*. There is evidence of the same love for animals, concern over the fortunes of the working classes, pictures of the cholera epidemic in Naples, etc. We recognize many of the same characters.

Had Dr. Munthe devoted his attention entirely to literature, there can be no doubt that he would have made as much of a success in that field as he did in medicine, though there is little question that he owes the background which is so human and appealing to his intimate acquaintance with the lowly, the sick, and the suffering. A delightful book, full of wisdom and kindness.

M. P. RAVENEL

Report of Second Conference on the Health and Wealth of Merchant Seamen—Paris: League of Red Cross Societies, 1929. 326 pp.

The second conference on the Health and Welfare of Merchant Seamen met at Geneva, Switzerland, October 7-9, 1929, under the auspices of the Norwegian Red Cross and of the League of Red Cross Societies. The conference was attended by delegates from fourteen countries, including all of the major powers. Nine international organizations interested in maritime activities were represented at this conference.

The agenda was divided into three general groups: namely, General Welfare in Ports, Medico-Social Organization, and Welfare at Sea. Discussions under this agenda include 43 papers and numerous communications and reports.

All manner of subjects dealing with the health and welfare of seamen are considered in this report. Generally, much of the discussion is devoted to port facilities which afford medical care and decent living conditions for sailors in port, and which shield them from environmental factors detrimental to their health and morale. These include rec-

reational facilities, the operation of hostels and sailors' homes, admission to local hospitals, and the control of prostitution. The control and treatment of venereal diseases is considered at length.

Several papers are devoted to the health and welfare of the sailor at sea. Consideration is given to his medical care on various types of ships. Such minor subjects as ships' libraries and the organization of sports and games aboard ship are also discussed.

In reading this report one cannot help but be impressed with the coördination of activities and the coöperation obtaining between the various organizations which deal with seamen. If work of this kind can be continued in the future, it is certain to be of great benefit to those who sail the high seas.

Necessarily, many of the papers are presented by title only. Nevertheless, the report contains a number of excellent papers and discussions which are well worth reading by those interested in the health and welfare of merchant seamen.

G. C. DUNHAM

Dietetics in Warm Climates—By *J. Neil Leitch, M.D., B.S.* With an Introduction by Brigadier-General Sir *J. A. Byrne.* London: Robinson & Sons, Ltd., 1930.

This is an excellent and comprehensive volume on tropical dietetics, which will be useful to the practitioner in the tropics, the administrator and other residents, or prospective visitors to hot countries.

The wealth of material is divided into 10 chapters, of which the first is the introduction, and the last a discussion of what the future may hold for the health of tropical peoples when the principles of dietetics shall have been applied. The others compose the text, interspersed with voluminous tables of institutional dietaries, as well as tabulations of analyses of food products, etc., derived from government reports, the

publications of research organizations, the statements of tropical workers, as well as the personal experience of the author.

The discussion of the physiology of tropical dietaries, the rôle of salts, vegetables and condiments, the various aspects, composition, effects, etc., of tropical dietaries, both native and institutional, as well as the regimen of the bungalow, are especially interesting and comprehensive.

The lists of tropical foodstuffs, their preparation, preservation, and nutritive values, are welcome and of manifest importance, while the chapters dealing with avitaminosis, and the diseases resulting from defective dietaries, food intoxication, fish, meat, and other forms of poisoning are excellent and concise. The author has succeeded in compressing into a small volume a great amount of essential information well selected and logically arranged.

It is a matter for regret that the author found it necessary to distribute advertisements of foods throughout the book in order to defray in part the expense of publication. These are usually full page, and while not detracting from the value of the contents, are not commendable, and are certainly not customary in works of equivalent worth and importance.

The book is well written, the author introducing what may be called local color, and the printing good.

L. C. SCOTT

A Compend on Bacteriology Including Pathogenic Protozoa—By *Robert L. Pitfield, M.D., and Howard W. Schaffer, M.D.* Philadelphia: Blakiston, 1930. 317 pp. Price, \$2.00.

This well known compend has reached its 5th edition, which in itself proves that it has been useful.

There are a few omissions which detract from its value, as Dorner's stain for spores and Ponder's for diphtheria,

the two best for their respective purposes of which we know. Gram's stain has also been improved by some modifications which are not mentioned, especially that by Hucker.

It is compact, and the descriptions of fundamental principles are clear. It can be recommended as one of the best in its class. The printing and illustrations are good. M. P. RAVENEL

BOOKS RECEIVED

THE GUIDANCE OF MENTAL GROWTH IN INFANT AND CHILD. By Arnold Gesell. New York: Macmillan, 1930. 322 pp. Price, \$2.25.

CLINICAL ALLERGY, PARTICULARLY ASTHMA AND HAY FEVER. By Francis M. Rackemann. New York: Macmillan, 1930. 617 pp. Price, \$10.50.

THERAPEUTIC USES OF INFRA-RED RAYS. By W. Annandale Troup. London: Actinic Press, 1930. 56 pp. Price, \$1.50.

A BIBLIOGRAPHY OF SOCIAL SURVEYS. By Allen Eaton and Shelby M. Harrison. New York: Russell Sage Foundation, 1930. 466 pp. Price, \$3.50.

THROUGH THE ALIMENTARY CANAL WITH GUN AND CAMERA. By George S. Chappell. New York: Stokes, 1931. 231 pp. Price, \$2.00.

HOW IT HAPPENED. By Adalbert G. Bettman. Philadelphia: Davis, 1931. 110 pp. Price, \$1.00.

TESTS AND MEASUREMENTS IN PHYSICAL EDUCATION. By John F. Bovard and Frederick W. Cozens. Philadelphia: Saunders, 1930. 364 pp. Price, \$2.75.

CARE OF THE INFANT AND CHILD. By Harry R. Litchfield and Leon H. Dembo. Baltimore: Waverly Press, 1930. 138 pp. Price, \$2.00.

THE REFERENCE SHELF. The Socialization of Medicine. Vol. VII, No. 1, Compiled by Edith M. Phelps. New York: Wilson Co., 1930. 190 pp. Price, \$.90.

ANNALS OF THE PICKETT-THOMSON RESEARCH LABORATORY. Vol. VI. London: Pickett-Thomson Research Laboratory, 1930. 470 pp. Price, \$10.00.

COMMONWEALTH OF PENNSYLVANIA. Yearbook of the Department of Health, 1929. Harrisburg: Department of Health, 1930. 198 pp.

HEALTH AND LIFE: CONSULTATIONS WITH EMINENT DOCTORS. Edited by Morris Fishbein. Vol. I. The Skin and Its Function by Morris Fishbein. The Care of the Normal Skin by Wm. A. Pusey. The Care of

the Hair by John E. Lane. Your Complexion by Morris Fishbein. The Hands and Finger Nails by Morris Fishbein.

Vol. II. The Periodical Examination by Ray Lyman Wilbur. The Prevention of Heart Disease by William St. Lawrence. Kidney Diseases by William I. Fishbein. Avoiding Anemia by Nina Simmonds Estill.

Vol. III. Foods for Health and Beauty by Morris Fishbein. Beauty Through Diet by Morris Fishbein. Diet for Those over Thirty by John Ruhrah. Tobacco, Coffee, Tea and Alcohol by Morris Fishbein.

Vol. IV. What Expectant Mothers Should Know by Charles B. Reed. Watching Baby's First Years by Julius H. Hess. Fitting my Child Physically for School by Henry F. Helmholtz.

Vol. V. The Breast and Cancer. Part I Examination. By Joseph C. Bloodgood. Part II. Diagnosis. The Signs of Tuberculosis by Esmond R. Long.

Vol. VI. The Dread Pneumonia by James B. Herrick. Diabetes: Its Prevention and Treatment by Elliott P. Joslin. Simple Goiter and Its Prevention by David Marine. Rheumatic Ailments by Solomon Strouse.

Vol. VII. Hygiene of the Eye by Harry Gradle. Hygiene of the Nose, Throat and Ear by Wendell C. Phillips. The Truth About the Teeth by Arthur D. Black.

Vol. VIII. Sleep and Health by Morris Fishbein. Baths and Bathing by Morris Fishbein. Exercise for Adults by Morris Fishbein. Personal Hygiene by Morris Fishbein.

Chicago: Manning Publishing Company, 1931. Boards. Price, \$.50 each. Set of 8 volumes, \$4.00.

LABORATORY MEDICINE. A Guide for Students and Practitioners. By Daniel Nicholson. Philadelphia: Lea & Febiger, 1930. 433 pp. Price, \$6.00.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Detroit, Mich.—November issue of *City Health*, the monthly bulletin of the Detroit Department of Health, is largely concerned with the annual report of the school health service for 1929–1930 and brings out the close coöperation between the Department of Health and the Board of Education. An excellent system of physical examinations, combined with a watchfulness on the part of the teachers, results in the discovery of physical defects in need of remedial action. While all parents are urged to have their own physician examine the child before he enters school, if this is not done, the school physicians give the examination during the first year of school. Also, if any child is 15 per cent underweight, he is given a thorough examination, and the teacher trained by a series of lectures and demonstrations, reports “defects or indications of defects of teeth, tonsils, palate, cervical, thyroid, skin, orthopedic system, vision, hearing, and for anemia,” to the school physicians, who then examine and make the report to the parents.

An educational campaign to urge people to have their children given toxin-antitoxin by their own physician is carried on through talks to the parents at the time an older child is examined, and through newspaper publicity. For the past two years, toxin-antitoxin has not been given in the schools, although vaccination against smallpox is continued, some 52,968 children having been vaccinated in the past year. All children of Detroit are referred to their own physician for diphtheria protection. Since discontinuing this work in schools, an intensive campaign has been waged to have preschool children taken to the private physician. All entering children have as part of

their regular history a notation made on their record cards as to their status in regard to diphtheria immunization. If the child has not been immunized, the condition is regarded as a “defect.” Every effort is made to have the parents take care of this defect. Of all kindergarten and first grade children, it was found that approximately 30 per cent had received toxin-antitoxin before entering school.

United States Public Health Service—The annual report of the Surgeon General of the U. S. Public Health Service of the United States for the fiscal year 1930 is an impressive volume describing health conditions and activities throughout the world. Through the International Office of Public Hygiene of Paris, the Pan American Sanitary Bureau, and the health section of the secretariat of the League of Nations, there was provided a constant interchange of sanitary information. A relatively favorable year is reported.

Approximately 350 to 400 cases of psittacosis occurred in the winter with a case fatality of 35 to 40 per cent. Cholera was reported in the Philippine Islands in May. In recent years the plague situation has improved, but during the year the disease appeared in African centers near Mediterranean trade routes. Yellow fever was reported from the West Coast of Africa and also from Brazil and Colombia. Smallpox cases were reported in larger numbers than in preceding years in India, England and Wales, and the United States.

In the United States, influenza reached its peak in January. Decreased birth and death rates are recorded over the previous year. Diphtheria showed a gratifying decline—45 states reported

71.4 cases and 6.6 deaths per 100,000 population. Ten years ago, 37 states reported 137 cases per 100,000 with a death rate of 13. The incidence of meningococcus meningitis increased steadily from 1924 to the winter of 1930, but in the spring the number of cases dropped. Pellagra has been increasing for several years and in 1929 the death rate was 5.5. Forty-five states reported 41,458 cases of smallpox in 1929; and for the period 1927-1929, 114,000 cases with 442 deaths. No instance of the importation from abroad of any quarantinable disease occurred during the fiscal year. At domestic ports, 1,211,796 alien passengers and 988,759 alien seamen were examined by medical officers under the immigration laws.

Demonstration projects in rural sanitation were carried on in 202 counties in 24 states.

While rural health work is applicable to communities in the United States comprising about 60 per cent of our total population, only about 23 per cent of the rural population is so provided. . . . It is the opinion of the Public Health Service and of the state health authorities, as well as of outstanding leaders in the field of public health in our principal educational institutions and elsewhere, that the development of efficient whole-time local health organizations through which all necessary public health activities may be conducted in proper sequence and in proper relation one to the other is the program which will yield a far greater return on the dollar invested in lives saved and sickness prevented among all age groups of both sexes than any program limited to special diseases or to particular elements of the population that has ever been tried out or suggested.

Enlightening accounts are given of investigations of public health problems, of medical services at marine hospitals, of measures for the prevention and control of venereal diseases, and of coöperation with official and unofficial agencies. Attention is called to the opportunities made possible by legislation enacted during the year providing for

the creation of the National Institute of Health, with the Hygienic Laboratory as a nucleus. There is authorized an appropriation of \$750,000 for the construction and equipment of additional buildings. Additional funds have been made available for the expansion in the cancer and industrial hygiene work.

Pasadena, Calif.—One of the most comprehensive health department reports of the year is that of Pasadena for the fiscal period ending June 30, 1930. An Advisory Committee on Public Health was appointed by the local branch of the County Medical Society at the request of the health officer. Following a list of these members are given the names of the department personnel with their positions. An organization chart of community health agencies, and a classified financial statement prepare the reader further for the body of the report, which follows in outline the *Appraisal Form for City Health Work* of the American Public Health Association. The per capita expenditure by the health department was \$.72, while per capita expenditures of other official and voluntary health agencies (including clinics, \$.59, and preventorium, \$.39) amounted to \$1.65.

On the basis of a population of 76,047, a death rate of 12.8 and a birth rate of 14.7 are recorded, while the infant mortality rate was 42.6. There were no deaths from diphtheria, scarlet fever, nor typhoid. Vital statistics tables and effective charts are accompanied by descriptive text.

Early in the spring, acute poliomyelitis appeared in the state, and with the appearance of 2 cases in the city in May, and 25 in June, energies were directed to insure prompt reporting and the collection and early use of convalescent serum. The chief nurse canvassed each case reported during the previous 10 years and attention was

called through the newspapers to the need of serum. Prompt response made possible an ample supply of serum for use locally and in neighboring communities. A 24-hour service was given to physicians by the laboratory and epidemiologist. Cases are charted by weeks, by age, and by months for previous years. "The efficacy of early diagnosis followed by the prompt use of an adequate amount of serum has been apparent throughout this epidemic."

There were 3,076 food handlers examined during the year, in addition to 126 examinations of raw milk handlers and 170 of barbers and beauty parlor operators. Results showed 37 cases of venereal diseases, 5 cases of active tuberculosis, and 4 arrested or suspicious cases of tuberculosis.

The 4 field nurses made 7,844 visits to patients in addition to their infant and preschool conference work, which showed an attendance of 5,349. There were 1,441 vaccinations against smallpox and 1,491 immunizations against diphtheria with which the nurses assisted. A tabulation of laboratory activities, with an appraisal, indicates an unusually effective service scoring 94 per cent. The vital statistics, tubercu-

losis control, and sanitation services also score over 94, while the total appraisal gives the city 721 out of a possible 1,000 points.

Bridgeport, Conn.—The report of the health department for the year ending March 31, 1930, occupies 91 pages of the *Municipal Register*. In 1929, there were 5 diphtheria deaths as compared with 21 in 1928 and 26 in 1927. The drop is credited to more intensive culturing, the use of only fresh and chloroformed Loeffler's blood serum, and toxin-antitoxin administration. Various educational activities of the year included the showing of 27 films with an attendance of 14,485, and 745 lectures with an attendance of 31,177. Lectures were chiefly on oral hygiene and diphtheria control.

The infant mortality rate in 1929 was 70.9, the outstanding causes of death being prematurity and respiratory diseases. A pulmonary tuberculosis death rate of 44.8 is recorded. After a course of instruction on the structure and function of the eye and in testing of vision, the nurses coöperated with teachers in testing the vision of over 4,000 school children.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Oral Typhoid Vaccination—Discussing the mechanism of oral vaccination against typhoid fever, the author opens up an interesting field to the student of nutrition.

ARNOLD, L. *Biology of Typhoid Fever and Oral Vaccination.* Illinois Health Quart., 2, 4: 140 (Oct.-Dec.), 1930.

Prenatal Mental Health—Well worthwhile is this discussion of the mental hygiene of the pregnant woman, about which much remains to be said in the promised succeeding issues.

ARRINGTON, W. W. *Mental Health Hints for the Prenatal Period.* Pub. Health Nurse, 22, 12: 610 (Dec.), 1930.

Nursing Opportunities in Child Hygiene—The public health nurse of the future, more an educator and less a "nurse," will be the chief factor in the improvement of maternal and infant hygiene, for which we now have sufficient knowledge and the necessary technics.

BOLT, R. A. *The Relation of the Nurse to Maternal, Infant and Preschool Health.* Pub. Health Nurse, 22, 12: 618 (Dec.), 1930

Milk-borne Disease—Striking indeed is the change in relative position of the enteric diseases and the throat infections in the tabulation of milk-borne outbreaks of disease in New York State during the past 13 years.

BROOKS, P. B. *Milk-borne Outbreaks in New York State.* New York State J. Med., 30, 23: 1418 (Dec. 1), 1930.

Illnesses Among Wage Earners—A statistical analysis of industrial morbidity data based on absences on account of disability among certain em-

ployed groups and persons belonging to sick benefit associations.

BRUNDAGE, D. K. *The Incidence of Illness Among Wage Earning Adults.* J. Indust. Hyg., 12, 9: 338 (Nov.), 1930.

Mental Hygiene Administration—Mental health problems and the objectives of mental hygiene are presented as a challenge to public health administration in a truly stimulating paper. The public health paper-of-the-month which all sanitarians should read and ponder over.

EMERSON, H. *The Mind in the Breaking.* Survey Graphic, 65, 7: 366 (Jan. 1), 1931.

Bottle vs. Breast Feeding—During the first quarter of the first year breast-fed babies gain more than bottle-fed infants; after that time the condition is reversed. Infections were generally lower among the bottle-fed group, giving no evidence of increased resistance caused by maternal milk. The authors urge breast feeding for a limited time, when conditions are satisfactory.

FABER, H. K., and SUTTON, T. L. *A Statistical Comparison of Breast-Fed and Bottle-Fed Babies During the First Year.* Am. J. Dis. Child., 40, 6: 1164 (Dec.), 1930.

Poliomyelitis Statistics—This twenty-odd year statistical study of poliomyelitis in Massachusetts leads to many interesting conclusions. Among others, a striking change in the age grouping since 1918 is shown, the 0-4 age period decreasing markedly with a compensatory increase in the 5-14 year age group.

FORSBECK, F. C., and LUTHER, E. H. *Anterior Poliomyelitis in Massachusetts, 1907 to 1929.* New England J. Med., 203, 23: 1115 (Dec. 4), 1930.

Duration of Breast Feeding—This seems to be the open season for slogans. The virtues of breast feeding are attacked in this paper, which has the rare merit of being most entertaining—a treat to which the reviewer of health literature is seldom exposed.

GARLAND, J., and RICH, M. B. Duration of Breast Feeding: A Comparative Study. *New England J. Med.*, 203, 26: 1279 (Dec. 25), 1930.

Mottled Tooth Enamel—An interesting study of an outbreak of mottled enamel in the teeth of children who used the offending deep-well water supply during the period of tooth development.

KEMPF, G. A., and MCKAY, F. S. Mottled Enamel in a Segregated District. *Pub Health Rep.*, 45, 48: 2923 (Nov. 28), 1930.

Venereal Disease Follow-Up—Social service returned old and delinquent cases, brought contacts and sources of infection for examination, accounted for a third of all new admissions, secured coöperation of outside agencies and generally raised the level of clinic service to the community.

LELAND, H. L., *et al.* Does Follow-Up Social Service Pay in a Venereal Disease Clinic? *New England J. Med.*, 203, 24: 1200 (Dec. 11), 1930.

Industrial and Private Medical Practice—To improve the employee's health habits, to protect him from disease and industrial hazards, to have his defects corrected, to provide preventive early treatment and educational services, and to coördinate industrial, private and state medical services is the work of the industrial physician. How organized medicine can further leadership in these activities is the burden of this paper.

SAPPINGTON, C. O., and MARBAKER, N. D. The Industrial Physician and the General

Practitioner. *J. A. M. A.*, 95, 26: 1955 (Dec. 27), 1930.

Effects of Maternal Nursing—Breast-fed infants grow to be more intelligent, physically superior children, freer from sickness than do those who start life via the bottle route. Animal experimentation and field studies lead the authors to this conclusion, which ought to give comfort to the breast feeding propagandists.

MAURLER and TSAI. Diet and Intelligence. *Illinois Health Quart.*, 2, 4: 131 (Oct.-Dec.), 1930.

Taking the Dust Out of Industry—Workers in dusty trades have excessive respiratory disease rates. Although the general tuberculosis rate has been halved, the rate among workers in dusty trades has increased. Other equally arresting findings are discussed.

RUSSELL, A. E. Dust and Pulmonary Disease. *J. A. M. A.*, 95, 23: 1714 (Dec. 6), 1930.

Atypical Dysentery—A mild dysentery-like epidemic disease causing symptoms that simulate food infections was studied and reported upon. The guess was that it might have been caused by an attenuated Shiga type dysentery bacillus.

SPENCER, R. R. An Unusually Mild Recurring Epidemic Simulating Food Infection. *Pub. Health Rep.*, 45, 47: 2867 (Nov. 21), 1930.

Hypertension in Industrial Workers—Arterial hypertension is an important industrial hygiene problem. Limitation of physical effort depending upon the degree of hypertension is advised.

WYCHGEL, J. N. Arterial Hypertension in Industry. *J. Indust. Hyg.*, 12, 9: 319 (Nov.), 1930.

NEWS FROM THE FIELD

NATHAN STRAUS

NATHAN STRAUS, who died on January 11, was born in Rhenish Bavaria, January 31, 1848. He came to America with his family in 1854, and settled in Talbotton, Ga. In 1866 he entered his father's business of importing pottery and glassware. He was also a member of the firm of Abraham & Straus, whose department store is located in Brooklyn; but he retired to devote his time to philanthropic work in 1914. He was president of the New York City Board of Health during 1898.

In 1892, a tragedy in his own family was responsible for the organization of the Straus milk stations, where pasteurized milk was sold to the poor at or below cost. His 2-year old daughter died on a trip to Europe, and it was thought that her death was due to contaminated milk. He began to make a study of methods for keeping milk and distributing it in better condition in order to save the lives of other children. It is said, "He helped three babies to live where only one had survived before."

At different times he has maintained centers for the distribution of milk, coal, food, and ice to the poor in New York City. In 1916 he sold his yacht and gave the proceeds to feed war orphans. In 1918 he started the distribution of pasteurized milk to soldiers and sailors, and in 1920 turned over to the Health Department of New York City his pasteurization laboratory and its equipment to be used for preparing ready-to-drink modified milk in nursing bottles. He was responsible for the first preventorium in the United States in 1909, in the Grover Cleveland cottage in Lakewood, N. J., and when residents of the

neighborhood objected, Arthur Brisbane gave 170 acres in Farmingdale, N. J., as a new site, and Nathan Straus gave \$50,000 toward the building fund.

In 1904 he first went to Palestine, and shortly thereafter began his work there for, first the sick, old, and blind Jews who had returned to spend their last days there, and then extended his relief work to include those of all races and creeds.

Mr. Straus celebrated his 80th birthday by sending funds to relieve the unemployed in Palestine, and also erected two health and welfare centers for all peoples, one in Jerusalem.

He was presented with the city flag at the Silver Jubilee of Greater New York in 1923 for services rendered during the preceding 25 years.

In 1895, during his early interest, pasteurization was still under suspicion, and politics entered the battle against it. He was indicted by a grand jury on a charge of watering milk. The fact was that his milk stations had diluted milk in accordance with a medical formula, to be fed to infants. It pleased Mr. Straus greatly later to recall this incident when the world was following in his footsteps in health work.

He was the author of many pamphlets on pasteurization. In 1917 his wife, Lina Gutherz Straus, published the book *Disease in Milk—the Remedy Pasteurization. The Life Work of Nathan Straus*, which included articles, reports, and letters by many well known physicians and others on the subjects of pasteurization and preventoriums. Mr. Straus has been a member of the A. P. H. A. since 1903.

SHORT SCHOOL FOR SEWAGE WORKS OPERATORS

A SHORT school for Sewage Works Operators, sponsored by the New York State Conference of Mayors, New York State Sewage Works Association, and the New York State Department of Health, was held at Union College, Schenectady, N. Y., January 26-31, 1931.

The purpose of this short school was to offer intensive training in the fundamentals of sewage disposal and in sewage plant operation by means of lectures, demonstrations, individual laboratory work and discussion.

ANNUAL MEETING OF THE AMERICAN SOCIAL HYGIENE ASSOCIATION

THE annual meeting of the American Social Hygiene Association was held at Hotel Pennsylvania, New York, N. Y., on January 23 and 24.

The subject for the afternoon session on the 23d was "Social Hygiene Educational Campaigns in Chicago and New York." A dinner was held at 7 P.M. and the following speakers took part in the program: C.-E. A. Winslow, Thomas Parran, Jr., Valeria H. Parker, Edward T. Devine, Jay F. Schamberg and Max J. Exner. The annual business meeting was held on the 24th.

SCHOLARSHIPS IN HEALTH EDUCATION

TWO full tuition scholarships of \$500 each are available for women in the field of health education at Massachusetts Institute of Technology (Department of Biology and Public Health) for 1931-1932. These scholarships cover the full scholastic year, beginning in September and closing in June.

The scholarships will be awarded on June 26, 1931, and applications should be sent not later than June 1 to the Child Health Education Service of the National Tuberculosis Association, 370

Seventh Avenue, New York, N. Y., for application blanks.

ANNUAL MEETING OF THE JERSEY CITY HEALTH COUNCIL

AT the Annual Meeting of the Jersey City Health Council held January 9, Bernard S. Coleman, Executive Secretary of the Hudson County Tuberculosis League, was reelected President for 1931. Other officers elected were as follows: Dr. Howard S. Forman, Honorary President; Ira M. Gast, Ph.D., Vice President; Adele McLoon, Treasurer; and Margaret Shea, Secretary.

NEW VENTURE IN MENTAL HYGIENE EDUCATION

THE Massachusetts Society for Mental Hygiene announces that through the generosity of the Godfrey M. Hyams Trust it will begin the publication early in January of a quarterly, *Understanding the Child*. This new magazine will be distributed free to every teacher in the public schools of Massachusetts. Its purpose is to bring to them a knowledge of the principles and practices of mental hygiene.

The Editorial Board for this new magazine will consist of J. Mace Address, Editor, and Dr. E. Stanley Abbot and Dr. Henry B. Elkind, Associate Editors. There will be a Consulting Editorial Board of fifteen members, composed of experts in the fields of mental hygiene and education.

A small annual subscription fee to the magazine will be charged for those who are not public school teachers in Massachusetts.

WORK FOR THE BLIND

DAVID Resnick has been appointed Director of Publicity for the World Conference on Work for the Blind, which is to be held in New York City

in April, 1931. President Hoover has invited fifty-two nations to participate in this conference.

DR. PETER TO ORGANIZE HEALTH EDUCATION FOR CHINESE GOVERNMENT

AT the invitation of the Chinese Ministry of Health, William W. Peter, M.D., F.A.P.H.A., Director of the Health Service of Cleanliness Institute, New York, N. Y., will go to China some time in February to help organize a national health education program for the Nationalist Government.

The directors of the Association of American Soap and Glycerine Producers, which supports Cleanliness Institute, have granted Dr. Peter 8 months' leave of absence with salary to enable him to undertake this special mission.

ALABAMA DAIRY MARKET SURVEY

L. C. BULMER, Director, Bureau of Food and Dairy Inspection, Jefferson County (Ala.) Board of Health, is directing, in behalf of the Alabama Industrial Development Board, a state-wide survey of Alabama Dairy Markets. The twelve largest centers of population are to be embraced in the survey.

BAUSCH MEMORIAL BRIDGE DEDICATION

ON New Year's day, the city of Rochester dedicated its newest and finest span across the Genessee River as the Bausch Memorial Bridge in honor of John Jacob Bausch, the founder of the Bausch & Lomb Optical Com-

pany. Mr. Bausch was a pioneer manufacturer of optical apparatus and has helped bacteriologists in this country greatly by his interest in science.

IOWA COUNTY HEALTH WORK

THE State of Iowa is moving forward in the development of its county health work, as evidenced by a recent report which states that Dr. E. R. Coffee of the U. S. Public Health Service has been detailed to the state in connection with county health work for a 2-year period. Full-time health units have already been established in Washington, Woodbury, Des Moines and Plymouth Counties. Two other counties, Johnson and Scott, are ready to organize.

THE PUBLIC HEALTH NURSE

THE *Public Health Nurse* announces a special number on Industrial Nursing, February, 1931.

DR. ADOLF MEYER RECEIVES FIRST AWARD OF THOMAS W. SALMON MEMORIAL

DR. ADOLF MEYER, Professor of Psychiatry of Johns Hopkins University, will receive the first award under the recently established Thomas W. Salmon Memorial. Dr. Meyer was selected in recognition of his distinguished services to psychiatry and mental hygiene over a period of years. The award carries with it an honorarium of \$2,500, and the recipient will give The Thomas W. Salmon Lectures during 1931.

PERSONALS

DR. PAUL M. LOWELL, Senior Medical Officer, Food and Drug Administration, U. S. Department of Agriculture, passed away at the Walter Reed Hospital on January 3, 1931.

JAMES CLARKE BRIGGS, of Selma, N. C., who gave his age as 108 years and believed himself to be the oldest physician in the United States, died on January 23, 1931.

DR. ARTHUR D. LITTLE of Cambridge, Mass., a former president of the American Chemical Society, was the recipient of the Perkin Medal, which is awarded annually to the American chemist who has most distinguished himself by his services to applied chemistry.

DR. HUNTINGTON WILLIAMS has been appointed secretary of the State Department of Health, Albany, N. Y., to succeed Dr. Edward H. Marsh. He will also serve as secretary of the Public Health Council.

DR. FRANK E. COUGHLIN has been provisionally appointed epidemiologist in the Division of Communicable Diseases, New York State Department of Health, Albany, N. Y.

DR. JOHN M. T. FINNEY of Johns Hopkins University, Baltimore, Md., and Dr. David Riesman of the University of Pennsylvania, Philadelphia, Pa., will join Dr. Roger I. Lee, consultant in internal medicine, of Brookline, Mass., as consultants of the Committee on the Cost of Medical Care.

E. G. EGGERT, for the past twelve years assistant sanitary engineer of the Texas State Department of Health, has announced his resignation from that office for the purpose of entering private practice, with headquarters in Austin.

DR. OSCAR DOWLING, recent State Health Officer of Louisiana, was killed in a railroad accident on January 2. He was a Charter Fellow of the A. P. H. A.

CONFERENCES

Feb. 16-18, Council of Medical Education and Hospitals of American Medical Association, Chicago, Ill.

Feb. 18, American Conference on Hospital Service, Chicago, Ill.

Feb. 19-21, White House Conference on Child Health and Protection, Washington, D. C.

Mar. 23-27, College of Physicians, Baltimore, Md.

Apr. 2-4, Association of Anatomists, Chicago, Ill.

Apr. 12-15, Tenth Annual Convention, International Society for Crippled Children, Cleveland, O.

Apr. 13-16, American Red Cross, National Convention, Washington, D. C.

Apr. 14-20, World Conference on Work

for the Blind, New York, N. Y.

Apr. 29-30, Conference of State and Provincial Health Authorities of North America, Washington, D. C.

May 5-6, National Conference on College Hygiene, University of Syracuse, Syracuse, N. Y.

May 11-14, National Tuberculosis Association, Syracuse, N. Y.

June 1-5, Psychiatric Association, Toronto, Can.

June 1-4, American Federation of Organizations for the Hard of Hearing, Inc., Chicago, Ill.

June 8-12, The American Medical Association, Philadelphia, Pa.

June 14-20, National Conference of Social Work, Minneapolis, Minn.

American Journal of Public Health

and THE NATION'S HEALTH Vol. XIII No. 3

Volume XXI.

March, 1931

Number 3

The Amelioration of Atmospheric Pollution*

HOWARD WHIPPLE GREEN, F. A. P. H. A.

Sanitary Engineer, Cleveland Health Council, Cleveland, O.

MOST large industrial cities are faced with the problem of the amelioration of atmospheric pollution. The magnitude of this problem may be illustrated by the results of measurements conducted in Cleveland during a 24-month period, June, 1927, to May, 1929. During this period, an average of 119 tons of material per square mile per month was deposited from the atmosphere at the collection station located in the downtown district. This, when analyzed, showed 23 per cent carbon and 77 per cent ash, of which 30 per cent was Fe_2O_3 . Nearly one-fourth, 24 per cent, of the total deposit was Fe_2O_3 . In addition to the material which could be collected, large amounts of carbon monoxide and dioxide, ammonia, chlorine, nitrous and nitric acid, sulphur dioxide, trioxide, sulphurous (SO_3) and sulphuric acid, and hydrogen sulphide remained in the atmosphere to corrode the buildings, play havoc with ornamental iron and metal work, and pass through the lungs of the residents. Although the atmosphere in Cleveland is not nearly so polluted as that in many cities in the United States, some days when one drives into the city from suburbs, college days are brought back as all the familiar odors of the college chemical laboratories enter the nostrils.

The solid and gaseous pollution in the atmosphere emanates from many sources. Not all of the solid pollution originates in the combustion of coal; dust and dirt particles blown into the air make up some portion; iron from the working of this metal, from industrial

* Read at a Joint Session of the Public Health Engineering and Industrial Hygiene Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

grinding processes, and from the wearing of street car rails and brake shoes; products resulting from the wear of asphalt pavements; minute particles of rubber from the wearing of tires and even rubber heels, are present in the atmosphere as well as the products of many other sorts of wear. Organic matter such as wood fiber, lint, and even grasses is also found in the deposit.

Unpaved streets, bare areas between street and sidewalk, playgrounds, back yards, parking lots, and other areas unprotected by vegetable growth provide prolific sources of atmospheric dust. The handling and storage of crushed stone, gravel, sand, lime, cement, brick, and tile increase dust production. Wrecking old structures and building new ones, constructing new streets and repairing old ones, transportation of merchandise, coal, ashes, brick and sand over city streets result in scattering materials on the street. The amount of this dust in the atmosphere depends upon the efficiency of city sanitation and standards of municipal cleanliness, as well as upon the methods employed in street cleaning.

A comparison of the deposit collected in the industrial area with that in the residential areas is of interest:

Region	Tons of Fe_2O_3 per sq. mile per month
Industrial	28
	17
	14
Residential	6
	5
	4

An appreciably greater amount of Fe_2O_3 is deposited from the atmosphere in the industrial regions. It may be assumed that little or no Fe_2O_3 originates from the combustion of coal.

It is already evident that the prevention of the black smoke which is so evident when being belched forth from the chimney is only part of the problem, but it is the only part which has as yet received serious consideration by municipal codes regulating air pollution.

The production of carbon monoxide and carbon dioxide by automobiles is receiving some attention, especially in tunnels used by motors and in the congested traffic in the valleys of our large cities.

The amelioration of air pollution may be analyzed by type of production. The type of fuel, the type of combustion chamber, the size and height of chimney, and the method of firing, all affect the problem of smoke production. Low volatile coal produces little smoke, while anthracite and coke practically none, even though other factors are

most unfavorable. The deposits of this coal are limited geographically; they are expensive; and higher volatile coals are more commonly used.

The size of the combustion space is most important and must be large when high volatile coal is to be burned without producing large amounts of black smoke, and must be calculated for each grade of fuel used. A high volatile soft coal requires a larger combustion area than a low volatile soft coal, while anthracite may be used satisfactorily with less combustion space and coke with still less.

The draft depends upon the height of the chimney, and the volume of air provided for combustion upon the size or cross-section area as well. The necessary height and size of the chimney may be calculated with a high degree of accuracy when the type of fuel and area of combustion surface are known.

The draft may be increased by the installation of blowers or steam jets, provided the area of the chimney is sufficient to carry away the gases afterward.

Mechanical stokers aid in the solution of the smoke problem. The over-feed type with low volatile fuels reduces the smoke because the feed is uniform and not dependent upon an erratic fireman.

An under-feed mechanical stoker feeds high volatile coal uniformly from beneath, which allows a gradual distillation of the volatile matter allowing for complete combustion and little smoke.

Powdered coal, if so fine that it will burn completely in suspension when blown into the fire box by a stream of air, is partially satisfactory, in that no black smoke is emitted from the stack in a proper installation, but probably 80 to 90 per cent of the ash is carried out of the stack, a much greater percentage than when other methods of firing are utilized. Devices have been designed to collect this ash but they are all expensive. The electrical precipitation method, designed originally by Cottrell for the precipitation of suspended metals in reduction plants operated in connection with mining projects, is one of the most satisfactory. This equipment is fortunately being installed by the larger plants using powdered coal, but unfortunately is too expensive for the medium size and small plant.

Smoke production by railroad locomotives may be reduced to a minimum by the installation of fire brick arches in the fire box, automatic stokers of the spray type, and by introducing forced draft in the fire box. Good steam jets should be installed and used when the locomotive is standing in the station or yard. When running, the exhaust from the cylinders passing through a blower nozzle creates a vacuum and draws a larger quantity of air through the combustion chamber,

reducing the amount of smoke which would otherwise be produced. Electric locomotives, as at present operated in Cleveland, of course eliminate the problem completely. The possibility of using gas-electric or oil-electric locomotives in the meantime might be seriously considered.

The stacks serving oil burners give forth no black smoke if operated properly, although the worst possible production of carbon may result if the air mixture is not properly handled. The innocent looking stack, however, emits large quantities of sulphur acids, which are disagreeable to the sense of smell. The sulphur acid fumes corrode steel, rot draperies and clothing, and cause other little suspected damages.

The production of sulphur acids is equally as serious when coal is burned. Under the very best conditions the soft coal in Cleveland carries 1 per cent of sulphur, which means 20 pounds of sulphur per ton, 75 per cent of which may be calculated as to be emitted from the stack. If all the sulphur were oxidized, 175,000 tons of sulphuric acid (H_2SO_4) would be emitted from the stacks in Cleveland during the year. No practical method has yet been devised for taking care of this evil.

The pollution introduced in the atmosphere by industrial plants is a problem in itself; in fact, a more complex problem for the large industrial city. Furnaces for metallurgical, manufacturing, and allied processes pollute the atmosphere with finely divided particles of various metals which appear as waste in manufacturing processes.

Replacing electric furnaces for the cupola with blast twyer which involves air blasts carrying large quantities of fine dust of steel and iron into the atmosphere improves the situation even though the circulation caused by the intense heat of the electric furnace carries some ash into the atmosphere.

Smelting furnaces for melting metal for castings may be handled by installing hoods over the open furnaces and providing settling chambers or bag dust collectors.

The blast furnace properly designed and operated does not present a great problem as the gases are now collected, cleaned and used to drive engines for power.

The operation of by-product coke plants pollutes the atmosphere, especially when being charged. In Cleveland the period of charging has been reduced from 9 to 4 minutes through careful time studies made by the City Department of Smoke Inspection. Further reduction of pollution is effected if the installation is designed as a wet seal process, which involves the gas pipes dipping into the tar mains.

The more extensive use of household incinerators, as well as the larger municipal types, introduces additional problems. When 60 per cent of the material to be incinerated contains 90 per cent water, it is unreasonable to expect the remaining 40 per cent to produce enough heat to evaporate this large amount of water and maintain temperatures high enough to insure complete combustion of the entire mass. In the large installations auxiliary oil or gas burners are usually necessary to raise the temperature of the gases sufficiently to guarantee complete combustion.

Some amelioration may be expected due to the careful inspection and intelligent advice of the smoke inspector relative to types of fuel, methods of feeding, and alterations in the equipment. The most optimistic feature of this whole problem lies in the fact that in most cases the necessary improvements result in sufficient savings in the fuel bill and labor expense to pay the cost within a short time, in some cases even within a year or a year and a half. Supervision by competent technical men of design and installation, and operation of all plant equipment burning fuel will in time reduce the preventable air pollution to a minimum.

The fundamental work of smoke control is in the prevention of the installation of improper equipment, improper types of stokers for the fuel to be used, undersized combustion chambers and stacks which will not produce sufficient draft for proper combustion.

Tuberculosis in the Philippines

THE Philippine Legislature has just passed a bill which has been signed by Governor-General Davis providing for the creation of a Tuberculosis Commission and appropriation of 200,000 pesos (\$100,000) for carrying out the objects for which the Commission was formed.

The passage and approval of this measure has been largely due to Colonel M. A. DeLaney, Medical Corps of the United States Army, Chief Medical Adviser of the Governor-General.

According to his report, tuberculosis leads all other diseases as the cause of illness and death in the Islands, and while it is decreasing elsewhere in almost every part of the world, it shows a constant increase in the Philippines—from 13,338 deaths in 1904 to 32,814 in 1929. Among the 13 million inhabitants, it is estimated that there are constantly present 500,000 cases of tuberculosis, and this is regarded by many as conservative. It causes 12 per cent of all deaths and even in the City of Manila, there were 1,949 deaths in 1929, against 1,737 for 1928. The chief causes seem to be lack of education, insufficient food, poor housing conditions and lack of isolation of open cases. There are only 300 beds available for the disease in the entire Islands.

The committee looks forward to the establishment of sanatoriums and widespread education in hygiene.

Hazards of Commercial Health Advertisements^{*}

IAGO GALDSTON, M. D., F. A. P. H. A.

Executive Secretary, Medical Information Bureau, New York Academy of Medicine, New York, N. Y.

SOMEWHERE in the writings of the Ancient Hebrews there is the tale of one of their kings who on the eve of an important battle consulted the oracle for advance news on the battle's result. The priest to whom the Hebrew king addressed his inquiry went through the elaborate ceremony of the ritual, and then announced in a deep, stentorian voice that the oracle revealed that a great kingdom would be lost on the morrow. "Yes," said the king, "that's all very good, but ask the oracle, whose kingdom will be lost on the morrow, mine or mine enemy's."

"O most mighty king," replied the priest, "on that score the Oracle is dumb."

The provocation of this story lies in the title of this paper assigned to me by the makers of the program—"Hazards of Commercial Health Advertisements." But, hazards to whom?—to the advertisers? to the public? to the advertising agencies? or to the health education movement? A great kingdom is to be lost—but whose kingdom? And yet it is well that the discussion was not prejudiced in advance by greater definition in the title. For, in truth, perhaps the hazards do confront all agencies mentioned, and others besides.

We are agreed only that there are hazards in commercial health advertising. We are left free to discuss their nature and the scope and embrace of their threat.

Pressed for a statement of the greatest hazard involved, I should say it is this—that the public health movement, and particularly its health education section, go on as it has so largely done in the past, ignoring commercial health advertising, opposing it, as the temptation to do so is great, and dealing with it as an interloper and upstart disrespectfully intruding into our sacred precincts.

In this attitude, I should say, resides the greatest hazard. But I must hasten to add that this very conference, our very willingness to

^{*} Read before the Public Health Education Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, October 30, 1930.

consider this problem, is an indication of our awareness of that danger, and of our eagerness to escape that threat.

It is imperative that we should realize that commercial health advertising is a permanent phase of our social existence. Truth to tell, it has been with us for more than a score of years, if we take the Metropolitan Life Insurance Company's welfare activities as an instance of commercial health advertising. We have recently become more acutely aware of its existence because of the phenomenal development of the health appeal in commercial advertising during the post-war years.

Furthermore, we must realize that commercial health advertisements are essentially legitimate, that no matter how this practice may be abused, the producer of a commodity cannot be disbarred by any abstract rule of justice or of ethics from persuading the public, through the promise of health benefits, to purchase his products.

In a word, commercial health advertising is here with us; it is here to stay; it is bound to develop and extend further; and, we must admit, it is a legitimate phase of business and social life.

In the light of these facts, what are we to do, we who are interested in safeguarding the health of the public, we who are particularly interested in health education?

In this connection, I am reminded of Elbert Hubbard's homely but wise stricture to the effect that the wise man is he who takes the lemons that fate hands him and goes into the lemonade business. Commercial health advertisements are not lemons in the sense in which the word was employed by Elbert Hubbard, but we should and must go into business with them. We must, to employ another phrase, play ball with the commercial organization whose promotional activities lead them into the field of health education.

That this can be done, and effectively too, is demonstrated by our experiences with the Metropolitan Life Insurance Company, with Squibb & Sons, Endicott-Johnson and a few other commercial organizations. An equally convincing demonstration of this fact can be seen in the commercial exhibits connected with this Annual Meeting, and in the commercial advertisements which fill the advertising pages of many thoroughly ethical medical and health magazines.

The deeper they reach into the everyday life of the people, the more effective are public health work and public health education. Commerce is a large part of the everyday life of people, and advertising is a large part of commerce. *Nolens volens*, we must face these conditions, and master them to the benefit of the public, of business, and of ourselves.

Commercial organizations have recognized these facts. They have in many ways sought to do business with us. They are receptive, in a larger measure than many among us appreciate, to our suggestions and advice, and they have a wholesome respect for the force of our opposition.

In all these respects our position would be strengthened by a well defined stand on commercial health advertising. At present, with but one or two exceptions, there is no such well defined stand taken by representative bodies. In New York City our Academy of Medicine, in coöperation with the County Medical Society, has created the Medical Information Bureau, to which advertisers, advertising agencies, and newspapers can turn for advice on health matters.

Scores of these commercial agencies have made use of this service. Many of them have offered to pay for what they received. Most of them have done business with us on a strictly ethical and legitimate basis. They have shown themselves willing to sacrifice appealing copy in order to gain veracity, and a certain portion of promised immediate gain, for good will.

The American Medical Association has recently established a comparable service. It now certifies certain foods and other products which meet its standards on composition and advertising. It issues a shield which producers and advertisers may use on their labels and in their advertising copy. This service promises to be of benefit to the public and to business. It constitutes a step in the right direction.

Desirable as I judge these developments to be, I am not unaware of the hazards involved, and having dedicated the first part of my paper to a plea for closer coöperation with commercial organizations whose business brings them into the health field, I shall now discuss the dangers involved.

These differ, as the commercial organizations differ, and, while we employ the term commercial health advertising to indicate a certain type of activity in the health field, there are a number of subdivisions and classifications possible under this heading, and an appreciation of these is desirable for a better understanding of the hazards involved.

We may classify commercial organizations conducting, or liable to conduct, health advertisements, under 4 general heads. There are, first, those organizations whose primary interest it is to keep people well and alive. Conceivably, this ought to be the interest of all business organization, with the exception perhaps of morticians, tombstone makers, and the like. Factually, however, only the life insurance companies figure prominently under this heading; their prominence, however, is great. Probably without exception, the insurance

companies spend more money on health education, health advertising, than any other commercial group. They alone of the sellers of commodities, due to the nature of their business, have an entrée into the homes of people as free and intimate as that of the district nurse or the tuberculosis worker. In the main, and with no exceptions known to me, the health advertising of life insurance companies has been acceptable, both to the critical scientist—jealous of the accuracy of the facts—and to the public health administrator—who is concerned with the trend and development of public health progress.

The past performance of these commercial organizations in the field of health education has been gratifying. It is also reassuring as to the future. One could conjure up for the easily horrified a disconcerting picture of what tremendous damage the life insurance companies, with their vast financial resources, their thousands upon thousands of agents, their closely integrated network of offices that cover the continent, might do by going off on a tangent. But such a picture would be more in the nature of a nightmare than a possible, or probable, forecast of the future. At the worst, we in the public health field might find ourselves, in relation to the life insurance companies, like the man who was loved by a bear, and who was affectionately hugged, but at the same time was pressed a little too hard for comfort. The insurance companies might at times press us too hard in certain directions of health work.

There is no great hazard in this group of commercial health advertisers, nor is the hazard liable to increase with the appearance of other and additional types of insurance organizations covering sickness, accident and old age.

The picture becomes a little more complicated as we face the second group of commercial health advertisers, in which we place all the producers and vendors of staples, such as foods, beverages, household goods, and clothing. Unlike the life insurance group, these commercial organizations are not directly interested in the promotion of health and the prevention of premature death. They, on the contrary, are interested in selling their commodities. They employ the health motive as a sales appeal, and as a promotional argument. "Buy this because it is good for you," is largely the essence of their advertising. "Use my product, and more of it, because it will help to improve or safeguard your health," is the substance of their messages.

Here again let me say that, in my opinion, the use of health as an advertising motif is in essence legitimate. More than that, it has been useful, having motivated producers of various commodities, from shoes to bed springs, to produce not only profitable but also hygienic prod-

ucts. Though this is not the happiest illustration possible, I call, in witness of this last point, the expeditiousness with which cereal producers applied irradiation to their breakfast foods, and used the alleged antirachitic value of this process as a sales argument.

However, precisely in this very case may be seen one of the hazards of the health advertising conducted by this second group of commercial organizations. They are liable and prone, by a salesman's zeal, to overemphasize, over-stress, and so distort health facts that from being facts they become fallacies.

Take, as an instance, the commodity milk. Who can deny that splendid work has been done by the dairy group in extending the consumption of this most useful food? And yet, in recent months there have appeared a number of scientific contributions from pediatricians complaining that milk has been oversold, that the standard formula of so many glasses of milk for every child every day is fallacious; that it does not take into account the possibility of a child's partial or complete intolerance to milk; nor does the dairy propaganda recognize that in certain children suffering from anorexia, the standard milk diet is highly undesirable.

In the opinion of many physicians, some communicated to me personally and others culled from current literature, fruits and vegetables too have been "oversold" to a portion of the public. Gastroenterologists meet with an ever increasing number of intestinal disturbances, and particularly with hypermotile colons, due to a fruit and vegetable diet which leaves too large and too irritating a residue of cellulose.

Whole grain versus milled flour bread is another item to be cited in illustration of our contention, with the brown claiming all the virtues of health giving, white bread on the defensive, and the public in a state of partisan intrenchment or bewilderment.

It is not pertinent to the argument that there are many communities where individuals do not drink enough milk, nor consume a minimally safe quantity of milk products; neither is the point that many do not consume enough fruit or vegetables. These facts, as such, are granted. So also, however, must be granted the fact that in the health advertising of many commercial organizations dealing in staples there is the ever present hazard of the distortion of facts, of overemphasis, of isolation and elevation of the value of one commodity or practice over others equally worthy of attention.

This last fault is particularly patent where certain of these commercial organizations enter with their materials into our schools. They give to the teacher complete health lessons, and attractive ma-

terial on, say, cleanliness, or milk—and what is the result? Their particular item is so stressed that the child too frequently is left with a distorted notion of the value of a daily bath, or of washing his hands, or of brushing his teeth, or of drinking milk.

I appreciate well that there is much that can be said in extenuation by the commercial organizations mentioned or implied in my argument, and it is far from my intention to lay the whole blame for these conditions at their doors. I construe my task as being merely to cite the hazards, and not to assign, or to apportion their source.

With the third and fourth groups, we need not at this time concern ourselves for long. In the third, I place all those whose products are cosmetic or “comforting” in character. They are large in number, as may be seen in glancing through the advertising pages of any so-called woman’s magazine. They include many soaps claiming special virtue as germicides, extreme purity, medicinal qualities and the like. Dentifrices, too, fall in this class, especially those which “harden the gums,” “prevent pyorrhea,” “protect the danger line,” “destroy decay producing bacteria,” and “whiten the ivory.” Feminine hygiene products, deodorants, skin foods, hair tonics, toilet papers, shaping garments, wrinkle removers—all these and others, too numerous to mention, belong in this group. They represent a hazard of waste. They mulct the public to the sum of hundreds of thousands of dollars. They distort the common person’s viewpoint on health, physiology and hygiene. They encourage practices which are sometimes injurious. They create a false sense of danger, as in the case of an advertisement which boldly stated that some 14 different painful and distressing diseases might arise from the use of unsuitable toilet paper.

The fourth group includes the vast sphere of the nostrum and the quack, a sphere too well known to you to need elaboration. With their health advertising, we are all acquainted; so too are we cognizant of the hazards involved therein.

I mention this last group, and also the third, for a particular reason. It is to point out that as we are obliged to coöperate with the first mentioned two groups, so are we in duty bound to combat the fourth and in part the third. Furthermore, to the extent that we support the health advertising of the legitimate commercial organization, to that extent will we be supported in our fight against the nostrum and the quack.

Legitimate business is interested in better business and in better business methods. Wildcat tactics are out of style. Even though in recent years there has been a sudden flaring up of objectionable advertisements, with a large ingredient of pseudo-health appeal, we must

not be misled by their appearance into believing that we have retrogressed, rather than progressed in the direction of more honest and more constructive advertising.

Legitimate business is hurt by the quack and the charlatan. We could, I believe, wage a more effective war on these parasites if we had the good will of the honest commercial health advertisers. This good will we can gain through coöperation.

A recent advertisement in the New York papers illustrates the subtle way in which commercial advertisers can coöperate with health workers. Macy, one of our large department stores, published an advertisement urging Mr. Averageman to have two winter overcoats; a light one for mild weather, and a heavier one for freezing days. The last lines in this advertisement read as follows: "Be comfortable and healthy. Have a topcoat, and a heavy coat. And a raincoat, umbrellas, rubbers, and a family physician, to boot!"

Such then are the problems with which we are faced in commercial health advertising. They demand and deserve the attention of our best public health administrators and diplomats. I sincerely hope they will be accorded all the careful thought they merit. We stand to gain much by their competent solution. Our greatest hazard lies in our being indifferent, antagonistic, and negativistic toward them.

Dental Survey of Hawaii

A SURVEY of the dental program in the Territory of Hawaii has recently been completed by Dr. Guy S. Millberry, Dean of the College of Dentistry, University of California. This survey has been published by the Territorial Board of Education and copies are available at \$1.00 each, through Dr. Millberry's office. This is probably the most extensive dental hygiene survey ever made in western United States, if not the entire country. Its findings are of great interest to school administrators and public health officials.

Preventive Trend in the Practice of Medicine*

GORDON BATES, M. D.

General Secretary, Canadian Social Hygiene Council, Toronto, Ont.

THE trend of medical practice toward prevention is inevitable and it behooves the average citizen to study carefully the means to this end. The reason lies in the fact that the possibilities in the direction of prevention by the application of scientific knowledge are very great. It should be obvious even to the most superficial observer that this is the consideration which will bear the greatest weight in the determination of the type of medical practice which will prevail in the future. The common good will unquestionably be the criterion of adjustment. How radical that adjustment will be remains to be seen.

The traditional type of medical practice is based on the possibilities of cure. Up to the last 50 years little thought was given to prevention because there was little knowledge of how to prevent. Today our point of view is changing with the increase in our scientific knowledge. We know that, largely as the result of the application of the work of Pasteur, about 18 years have been added to the expectation of life in a little over 50 years. Some of this has been due to the application of scientific knowledge in ordinary medical practice; much of it has resulted from communal action in which the health officer—usually a physician, working in a profession the practice of which is so unlike ordinary medical practice that he may be said to be a member of a new profession—plays a very great part.

Today we attempt to ascertain how much more remains to be done and how it is to be done, particularly the part which is to be played by the medical practitioner—using the term in its accepted sense. That much remains to be done cannot be gainsaid; nor the tremendous social significance of the task and its achievement be denied.

Illness is too prevalent and preventable illness and postponable death are too costly. Investigators tell us that 2 per cent of our entire population is constantly suffering from disabling illness. Irving Fisher estimates that 2.5 per cent of all workers in the United States are constantly ill. An English investigator estimates that workmen

* Read before a Special Session on Preventive Medicine of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 29, 1930.

in England average 1.2 weeks of sickness per man per year. Dublin estimates the total capital value of lives which can be saved annually through the application of modern preventive medicine and public health measures at over 6 billions of dollars. An estimate by Rankin¹ is as follows:

\$ 2,500,000,000.00	for treatment of diseases
2,000,000,000.00	loss from decreased wage earning capacity
6,000,000,000.00	loss of wage earning capacity through postponable deaths

Total \$10,500,000,000.00

This is one-ninth of the total annual income of the United States, estimated at 90 billion dollars.

Proportionate figures would apply to Canada. In view of the fact that the dollar yardstick is the most widely accepted means for ascertaining the purport of social statistics these figures are significant, particularly when it is realized that perhaps 50 per cent of our illness is preventable and 30 per cent of our deaths are postponable.

Granting the relationship of the health officer to all of this—what has it to do with medical practice?

I think that it was Dr. George Vincent who coined the prophetic phrase "The practising physician is the ultimate health officer," and one must immediately acknowledge that in some cases there is a clear-cut relationship between the cure of a disease in the individual and the prevention of its spread to others. This applies to all of the communicable diseases. The pediatrician, however, has been the first to apply preventive medicine deliberately in his everyday private work. Transferring the activities of the well baby clinic to his consulting room he not only advises as to the diet and general care of the apparently well child but as to all methods which may be employed to prevent preventable ills. Vaccination and immunization against diphtheria he utilizes as an obvious duty rather than waiting to treat the diseases which may result if he neglects them.

Possibly such methods are evidences of a trend which will show itself also in the consulting room of the general practitioner. Judging from our communicable disease statistics the time is not yet. All children are not cared for by pediatricians, and in spite of the fact that toxin-antitoxin and toxoid are available for immunization there is far too much diphtheria, although most creditable showings are made by some cities in which carefully planned campaigns have been carried on. Indeed in some cases the incidence of diphtheria has been reduced almost to zero.

A difficulty in connection with this problem lies in the fact that the greatest mortality is in the ages between 2 and 5. While organized

health departments have little difficulty in dealing with the school age child, these younger children constitute a class with which it is harder to get in touch. One cannot but feel that a plan should be developed here which involves new machinery. Possibly in the utilization of the services of the family physician lies the solution of this as well as other health problems.

It has been pointed out by statistical experts that not only is it true that prevention is of advantage to the community but that the physician may ultimately feel its monetary advantage. It seems paradoxical, but actually utilizing the services of the general practitioner and granting a reasonable scale of remuneration for his services, the total elimination of a disease such as diphtheria would cost the state less than it is paying now in doctors' fees, hospitals and deaths. At the same time the physician would probably profit more than now.

I am informed by Dr. Henry Vaughan that in Detroit through a generally adopted coöperative scheme between the Health Department and the profession a program of general diphtheria immunization is well under way. It has been necessary to adopt a standard fee for the immunization of non-indigents, a slightly smaller fee to be paid by the city for indigents. Of course a general campaign of public education has been necessary. One need not go into the details of this plan here but it would seem that such a scheme, or a modification of it, should be applicable almost anywhere. In connection with the Detroit scheme public health nurses have been sent into districts with high diphtheria rates to urge immunization for all children between 6 months and 6 years of age. In one area, out of 900 children between 6 months and 2½ years, 800 were immunized within 30 days. All of this work is done by the coöperating family physician, not by the Health Department direct.

The same principle in a modified form has been adopted in other places. In East York, a township near Toronto, 7,000 children, school and preschool ages, were immunized by the local practising physicians. This work was done in school buildings at a fee of \$.25 per child, paid by the municipality, dealing with as many as 200 an hour.

There are other phases to the adoption of preventive methods by the general practitioner. There has been a decline in death rates and an increase in the average duration of life during the last few years, largely the result of the reduction of mortality rates in childhood, and largely the consequence of organized public health methods. Infantile mortality rates have fallen and steps have been made towards the eradication of the communicable diseases.

Unfortunately little seems to have been achieved in the direction of cutting down mortality rates in the later decades, in which particularly incipient conditions neglected may proceed to a serious or fatal issue. An infected tooth—relic probably of the period previous to preventive dentistry—if not removed may be followed by all the dire results of focal infection. Mounting blood pressure, cancer, tuberculosis, or a positive Wassermann reaction neglected, means disability or death. Bad habits, too little or too much exercise, worry, overeating, heavy drinking, and overwork, all are conditions not followed necessarily by immediate symptoms, although the end consequences may be serious. Generally, the physician is consulted too late. His services are too frequently not nearly so valuable as they might have been had the consultation been earlier. The lesson is obvious and the cure—periodic health examination.

About 2 years ago, through the coöperation of the Dominion Department of Health and the Canadian Medical Association, a standard form for the examination of the apparently well was printed and sent to every physician in Canada. The number which has been used is problematic. The need is obvious; and yet the physician trained in the curative school frequently looks askance at the prospective client who in answer to the question, "What is your complaint?" is unable to provide a description of an ache or a pain. The public, still unaware of the advantages of the scheme, on the whole stand aloof. The need for two educational programs—one for the public and one for the physician—is obvious.

A recent Canadian scheme involving the coöperation of several large life insurance companies with the Canadian Medical Association to the end that certain policy holders may be examined by their own family physicians, using the standard form, is at least an educational gesture of value.

There are other reasons for the development of a preventive program. I have suggested that curative medicine as it is now practised has its inevitable connection with prevention. In a Milwaukee 1-day survey it was found that less than 40 per cent of the sick people had a doctor in attendance. Again in a survey conducted by the Metropolitan Life Insurance Company it was shown that members of large families cannot pay so much for medical care as those in small families. Persons living alone paid out an average of \$75.63 in 6 months for medical care, whereas those in families of 9 or more paid out only \$6.64 during the period. The effect of this situation is, of course, to throw the members of the large family of the type surveyed in this group upon the mercies of the community. Hence the clientele of the

free clinic, and what may well be termed the exploitation of the physician.

One cannot on this occasion go into this phase of the question at length, but it should be said that this and similar considerations have in most civilized countries forced public attention to the question of health insurance. Health insurance is probably inevitable on this continent and its coming will exert a profound influence on the progress of preventive medicine. In Canada, a Royal Commission has brought in a special report on the subject in British Columbia, while in Alberta an inquiry by a Special Committee of the Provincial Legislature will probably have far reaching results.

There are other developments which have their influence on medical practice. The health unit program in both Canada and the United States is spreading very rapidly, with a marked result in the direction of diminishing rural death rates. In Western Canada the travelling clinic maintained by the government has been developed for the purpose of providing dental and surgical service for the correction of defects among school children. This clinic, self-contained, moves by motortruck, operates in schoolhouses or other suitable buildings, and the staff lives in tents. Operating in the more scattered districts of this province it is said to carry its service to persons who otherwise would be uncared for in this regard. A moderate fee is charged.

Another development which is having its influence on medical practice is the plan in Western Canada (Saskatchewan) where certain areas operate municipal hospitals and employ municipal doctors. Seventeen rural municipalities in this area employ doctors on a full-time salary of \$3,000 to \$5,000 yearly, who give free medical attention to all and undertake the general public health work, such as school inspection, vaccination and diphtheria immunization as well. This is, of course, pure State medicine.

One might also here discuss the pay clinic and its various advantages and disadvantages. There are unquestionably many developments in medical organization at this time which illustrate the trend toward prevention and its reasons. The fundamental factor which is responsible is unquestionably legitimate public demand. Manufacturers and employees alike—indeed, our general citizenship—are rapidly realizing the profound social significance of neglected illness and neglecting the prevention of illness. It is so great a problem that no country can afford to ignore it.

Influences which tend to oppose this trend must be frankly described as reactionary. I believe that the action of a well known local American medical society in expelling a distinguished neurologist

because of a perfectly legitimate transaction with a physician of whose activities as a director of a pay venereal clinic, the society happened to disapprove, was a demonstration of one of the most objectionable phases of medical trades-unionism. I say this in the belief that trades-unionism in its accepted sense is a good thing.

Similarly one cannot but feel that the public address by a distinguished British pediatrician at the recent meeting of the British Medical Association, in which he attacked education of the public in health matters as well as the idea of periodic health examination, was but a demonstration of another reactionary trend, giving the critical observer interested in public health the opportunity for caustic criticism of the passive resistance of the clinician to public health ideas. This kind of thing, it seems to me, makes a very bad impression on the thinking public.

One cannot but feel that where communities are planning health programs the first group to be consulted should be the medical profession, but it is also true that the first group to lead should also be the medical profession, the members of which should exhibit the greatest concern at high sickness or death rates. A specific suggestion here is to the effect that in local health boards representation of the profession and of the medical teaching bodies in the larger cities would be a means of giving practical expression to this spirit which is unquestionably latent in the profession at all times.

A medical philosopher once said that the medical profession constantly tends to eliminate itself. This statement is only true to a degree. The profession tends to adjust itself to new conditions and adjustment must in the long run be in the direction of the greatest good for the citizen in whose welfare the practice of medicine plays so great a part. The advocates of individualism and the opponents of paternalism may have some truth on their side, and in the rapid development of this day and age we must not forget the virtues of what we have. I believe that the final form in which medical practice will crystallize will be determined by the part it can best play in insuring for humanity that in following generations there may be healthy childhood, robust maturity and an ever greater number of citizens enjoying healthy, efficient lives for an ever increasing number of years.

REFERENCE

1. Rankin, W. S. The Economics of Medical Service, *A. J. P. H.*, 19, 4: 359 (Apr.), 1929.

Preventive Medicine in Private Practice*

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IT is the purpose of this paper to discuss preventive medicine from the point of view of the practising physician, and especially to consider the relationship between the health officer and physician in regard to this subject.

The fact that we are holding such a symposium, suggests that there are certain conflicts between these two groups, or at least that they have failed to coöperate properly at times. Whatever differences there may be between the practising physician and the public health official, I think are overestimated, and when present are due largely to varying points of view. This symposium further indicates a desire to eliminate any possible differences which may exist. This is, of course, absolutely essential before any real progress can be made in preventive medicine.

It is true that there exists a certain suspicion in a considerable element of the medical profession of certain public health activities. This is based largely upon the erroneous notion that these activities are encroaching upon the practitioner's field and if continued will result in loss of practice and consequent loss of income to him. The fear of State medicine is constantly present and while properly conducted public health work should not be confused with State medicine, sufficient tendency in this direction has been shown in certain localities to warrant suspicion. The thinking and progressive men in medical practice do not fear State medicine.

It is obvious that some development in medical practice is necessary to extend adequate medical service to every member of the community, and to adjust the present economic imbalance between income and the cost of medical care. What physicians are anxious to do is so to guide this development as to avoid the socializing influences, the initiative destroying and paternalistic effects, the political complications, and other numerous dangers which have appeared where State

* Read before a Special Session on Preventive Medicine of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 29, 1930.

medicine has been tried. Extreme conservatism must be applied in making such vital changes in our social structure. The practising physician is just as much interested in extending medical services and knowledge as is the public health worker. It seems that further co-operation toward the development of methods of reaching our individual and collective goals is what we are trying to attain.

Undoubtedly the chief difference between the physician and the health official is that the former deals with the individual and the latter with the group, but we must not lose sight of the fact that the group is made up of individuals. The physician is interested in the health and well-being of his patient as an individual. How he compares with the norm is of little significance. He knows him personally. He knows his background, his social status, the details of his life. He is successful in so far as he helps this individual to better living. The health officer thinks of his work in terms of cases per 100,000 of population. He visualizes his community on a chart. Curves of birth rates, death rates and disease incidence largely indicate his success.

The physician is dependent upon his patients for a living. How well he cares for them and pleases them, determines to a considerable extent his income. In other words, the quality of his work determines his individual success. This is the one vital point which must not be changed with any developments in medical practice, and is the one overwhelming and so far unanswered objection to State medicine. When we take away from the practice of medicine the direct responsibility of the physician to his patient, it will be a sorry day for the patient.

The health officer on the other hand is independent of his group, and unfortunately in many communities is dependent upon his ability as a diplomat and politician for his success. He may be the best health officer in the world, but unless he can make his local officials think so, he may be out of a job. There is consequently a natural tendency to make a showing, rather than to do the most work where it will do the most good, and the annual report becomes a thing of great moment.

Physicians are naturally conservative. If they are not, they soon become so, if they wish to succeed in private practice. We all admire the man who does a piece of revolutionary research, and much of our progress depends upon his enthusiasm; but when we are sick we want a man with plenty of experience and a reputation for caution. We are willing to have the new things tried on some one else. Physicians consequently take to new things and new ideas slowly. They cannot recommend procedures to their patients until their merit has been

shown conclusively for, not only often, but usually, the new discovery of today is the failure of tomorrow.

Health officers on the other hand are likely to be progressive. New things and new methods appeal to them. This is as it should be, and under ideal conditions the two groups should balance one another.

Most of the lack of understanding and potential conflicts between health officers and physicians are based upon these differences in point of view. Therefore, they are not real or vital and can be readily eliminated by more intimate relationships and more frequent exchange of ideas. A proper adjustment of these viewpoints will certainly be to their mutual benefit, and will be necessary to the achievement of any permanent program in preventive medicine.

While preventive medicine is by no means new, our conception and application of it have changed greatly in recent years. Many of the new phases are still in a very formative stage, and we are sometimes not certain as to proper procedure, but the ideal of preventive medicine is here. The public does not have to be sold to it but is eager for it, and it places a great responsibility on us to know how far we can safely go without destroying that ideal and the confidence of the public. The physician of the future will give much of his time to purely preventive work. Already our organization devotes at least one-third of its time to this type of practice and we regard it as only the beginning.

I wish to discuss briefly the relationship between the health worker and physician to two phases of preventive medicine with which as a pediatrician I am especially familiar. These are routine prophylactic examinations, and immunization against contagious disease. The general principles involved here are doubtless the same as in the various other phases of preventive medicine.

We can assume without any argument the desirability of extending these two things to our entire child population. No intelligent person could question the merit and overwhelming benefit of such work after even the most casual inspection of our vital statistics during the past 50 years.

Having taken for granted that this work is worth our very best efforts, we are interested in working out methods of furthering it and especially of determining the relationship between, and the relative responsibilities of, the health officer and physician to this type of work. I cannot see that this is a problem which should give us any particular trouble. The functions of these two groups are fairly definitely established and from what I know of both, neither has any desire or intention to encroach upon the other's domain.

As brought out earlier in this paper, the function of the health officer is general to the community as a whole, the function of the physician is specific to the individual. The essential work of the health officer and public health worker is to keep records of the health of the community, to organize and carry out methods of improving that health, to distribute information which will arouse the interest and increase the knowledge of the community in its health, and to conduct such clinics and health centers as are necessary to arouse popular interest and to care for those persons unable to provide this type of medical care for themselves. The work of the physician is of a much more technical nature. He is interested in the scientific aspects of medicine and not in its organization. His work is to study and advance medical science, to examine patients, and to apply that scientific knowledge to them, and to give them individual and collective advice for the improvement of their well-being. The average physician must do this work through the daily contact with the individuals of his practice and to some extent through coöperation with public clinics.

The chief criticism I have to make of this work, as done by both health officers and physicians, is that they do not do nearly enough of it. The more child welfare work is developed, the more of it there is to do. In communities where there are no clinics and where the physicians show little interest in prophylaxis there is little or no demand for such service, but where clinics are common and physicians interested, the demand increases steadily. The type of clinic referred to in this discussion is not the hospital or the private physician's clinic, but those public ones whose aim is prophylactic and educational.

Such clinics have been criticised by physicians at times for certain reasons: (1) the fear that they would take business away from the doctor; (2) because they are not always careful in controlling the social groups admitted; (3) because they frequently extend their work to include the care of sick children; (4) because at times certain nurses and social workers have been indiscreet in disparaging the work and merits of physicians in their community.

It is extremely shortsighted for any worthwhile physician to think that a well conducted prophylactic clinic in his community can do him personally anything but good. Patients whom he would care to have among his private clientele will not attend a public clinic if they are able to afford his service, provided he gives them the same or better service. Every patient who is well cared for in a clinic will be the cause of several going to a private physician. The better and more completely the public health clinic in his neighborhood is conducted

and the more interest he shows in its success, the better educated in health matters that community becomes and the greater the physician's individual success. Wherever infant welfare work has been well conducted, there pediatricians flourish, and the same principle applies equally to the other branches of medical practice.

Clinics, of course, must be careful of the social status of persons admitted. Health workers are as well aware of this as anyone and offenses are isolated instances and not general. Financially competent persons who are willing to attend a free clinic are probably the type who would not pay their doctor's bill anyway.

The criticism that prophylactic clinics frequently care for sick children, however, is a serious and just one. Nothing but well children should be admitted to such a clinic. The minute we begin to take care of sick children in a well baby clinic, we begin to do poor prophylactic work and much worse therapeutic work. It is true that we find it difficult to turn away a sick child, but that is another problem and must be handled in a different way. This is an offense frequently committed and will do more to arouse the antagonism of physicians and destroy the confidence of the public than almost anything else.

If it is shortsighted of physicians not to appreciate the value of clinics to them, how much more is it shortsighted of social workers to criticise and depreciate the doctors of a community. Of course, only thoughtless persons would ever do this. If these will remember that the physician is much more deeply entrenched in the confidence of the public than they can ever hope to become, they will be more careful. No physician, however reactionary and uncoöperative he may be, can afford to be antagonized as long as he is sincere, and a few kind words about him and to him will usually convert him from an opponent to a supporter.

Lay organizations which foster and carry out public health activities are the chief offenders along these lines, because their policies are often controlled by emotionalism and conscious altruism, rather than careful consideration of facts. One point which I wish especially to emphasize is that all public health clinics should be supervised by the best medical talent available. The staff should be largely young men and those desirous of obtaining training; but at the head must be an outstanding man to direct and train that staff. If this is well done, not only is the work of various clinics unified but the standard of practice will be set for the whole community.

The problem of immunization against contagious disease is controlled by essentially the same principles as already discussed, and seems to me a very simple one. There is no question about the de-

sirability and urgency of having every child immunized against diphtheria and smallpox. This problem again is divided into two parts—selling it to the public, and its technical administration. The first is in a large part the work of the health official, which he is in a very strategic position to put over, through all varieties of advertisement, circularization, canvassing, and general methods of propaganda. Most of the public can be influenced in this way, and the remaining doubters can usually be convinced by a word from their physician. Nothing more is necessary to fulfil our objective in this program than to give it our sincere and constant attention.

The technical administration of these prophylactic measures is, of course, a purely medical function and must be done with care unless we wish to run the risk of antagonizing the public. Nothing will serve to offset our most complete publicity efforts like the poor handling of this phase of the work. Toxin-antitoxin and vaccination must always be administered under the supervision of a physician. The herding together of large numbers of children in clinics or schools to carry out these procedures without giving thought to the condition of the individual child will result in the antagonism of a large group of parents. This is as much a medical procedure as the removal of tonsils or the regulation of diet, and at least a superficial physical examination must be given in every instance.

We have made it a policy for several years not to carry out these procedures on patients who came to us asking for them without giving an examination. It is surprising the frequency with which conditions are present, which if not explained might give an erroneous and harmful impression to the patient. I am sure that this has had a great deal to do with establishing the confidence of our patients in the procedures and in us, and has rendered it increasingly easy to sell prophylaxis to our clientele. While we may feel that scientifically little harm is likely to result from administering these things to even quite sick persons, it is very difficult to convince laymen of it, and much wiser to avoid the necessity of so doing. In so far as possible, toxin-antitoxin injection and vaccination should be done by the family physician. Only where persons are financially unable to pay for it should clinics be used, the same as with any other medical procedure.

It should be mentioned for the benefit of those who may think otherwise that preventive medicine is just as much a medical service as is mending a broken leg or delivering a baby; it requires just as much or more training and clinical skill; and as such is entitled to a corresponding fee to the physician. Properly carried out preventive medicine is of more value to the community than therapeutic medicine

and fully as worthy of satisfactory financial reward. We have no trouble in getting our patients to pay well for such service.

I wish to make just a brief comment about the necessity for conservatism in public health programs. We must not go before the public with definite recommendations until we are absolutely sure that the things we are recommending are true. In our enthusiasm to improve conditions we may do more harm than good unless we are on firm ground. What I mean can be well illustrated by the effect which the nutrition clinics, which were so popular a few years ago, have had. While very little, if anything, has been done to improve actual nutritional conditions those of us who are in private practice know that a great many serious psychiatric and behavior problems have resulted from the excessive and ill-guided interest of mothers in nutrition.

At the present time considerable interest in mental hygiene is being shown and clinics of this type are being established in increasing numbers. This is splendid from an experimental and scientific point of view, but must not be sold to the public as a sure thing, because in another decade our views will doubtless be very different. Much splendid work concerning the prevention of scarlet fever has been done in recent years and our anxiety for a method of controlling this disease is likely to bring us before the public with procedures which are not tried. Those of us who have tried scarlet fever prophylaxis know that it is very imperfect, and unless we wish to prejudice the public against it, we had better confine ourselves to further experimental work for the time being.

In summary, then, let me say again that I can see no cause for conflict between the health officer and the physician. The function of the health officer is to organize, to advertise, and to supervise public health activities. The function of the physician is to develop and apply medical science. Only by complete coöperation between the two groups will the realization of our ideals of public health be attained.

Tularemia

RECENT reports to the U. S. Public Health Service indicate that an unusually large number of cases of tularemia are occurring this winter. Because of economic conditions, rabbits form an important article of diet for a number of persons in many sections at the present time.

Although a new disease of man, tularemia has now been recognized in 43 states, in the District of Columbia, Japan, Canada, Russia and Norway.

European Methods of Attacking the Disease Prevention Problem*

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THE medical and public health systems existent today in the United States present certain aspects which are unsatisfactory on the one hand both to the general public and to the far-sighted public health official, and on the other to the practising physician.

Active and effective prevention of preventable disease is today the keynote of any intelligent public health program. The leaders in preventive work have been for the most part public health officials. Supporting them in their aims is the majority of the lay public. More and more are the American people awaking to the possibilities of a higher level of health through active prevention, and more and more is the popular demand for good medical service at reasonable rates being accompanied by the additional demand for more expert assistance in keeping well.

That the efficiency of our preventive work does not even approximate its possibilities is illustrated by such facts as the following: constitutional diseases, such as heart and kidney disorders are definitely on the increase; nervous and mental disorders are increasing at an alarming rate; syphilis and gonorrhea remain fairly general, especially in rural districts. We have still 40,000 cases of smallpox annually, and the incidence of diphtheria is much greater here than in many other civilized countries. Our maternal and infant mortality rates give us no cause for pride. In 1927 our maternity mortality placed us low in the list of all nations compiling data on this subject. For every 10,000 live children born, 65 women lose their lives from causes connected with childbirth. Our infant mortality rate also suffers by comparison with that of many other countries.

These are some of the conditions which our public health officials wish to remedy, and the remedying of which our lay public is beginning to demand. To accomplish the task under our system would require the unified work and complete coöperation of all private practitioners.

* Read before a Special Session on Preventive Medicine of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 29, 1930.

Meanwhile the private practitioner is confronting certain problems of increasing difficulty. First and always present is the difficulty of collecting bills, the worry of making a living. Second, he now finds his practice increasingly encroached upon by the free or institutionalized medical services of state or city governments and of various organizations. The high cost of health service is causing free clinics to extend their fields of activity more and more into the middle classes, while the failure of many private practitioners to carry on preventive work and to coöperate with public health officials is making it increasingly necessary for public health departments to extend their services into fields formerly held sacred to private practice.

On both sides, then, is cause for dissatisfaction. Is it reasonable to believe that under our present system an adjustment satisfactory to all can be made? Can private practitioners remain as they have been in the past—each to his own patients the individualistic dictator of health standards, of medical costs, of prevention or non-prevention? Meanwhile can he keep his private practice intact in the face of new popular demands? Is it probable that private practitioners will unite in a coöordinated, purposeful program for enforcing the policies of their public health officials?

In brief, can we expect to see the problem solved under our present system by complete coöperation and unification of aims? Without doubt we all should like to answer, yes. I, personally, can find no reason to support such an optimistic outlook. The intensity of the conflict and the difficulty of the problem show signs of increase rather than decrease. Furthermore certain elements inherent in private practice make the accomplishment of a unified and efficient system of preventive medicine highly improbable.

First, our much cherished individualism in private practice deprives the public of the advantages of unified effort under expert direction. Only the man of exceptional vision and ability is capable of seeing the possibilities of active preventive work and of causing those possibilities to materialize successfully. The majority of our private practitioners, like the majority of all men, are not gifted with exceptional vision and ability. Acting individually then, they cannot be expected to add greatly to the accomplishment of important preventive work.

Second, the average private practitioner feels that he can spare no time nor effort from the pressing business of building up and maintaining a routine practice. To carry active, educational preventive work into the community as a whole requires time and effort which the practitioner feels must be necessarily applied to the routine of making a living. This daily necessity of maintaining a practice automatically

places the emphasis upon curative rather than preventive medicine, and to the average practitioner the preventive phase is consequently comparatively uninteresting and remote.

I can see no hope of these factors undergoing any significant change, while human nature remains human nature. It is a significant fact that those countries which in recent years have made marked improvement in the health of their people have done so not by trusting to individual effort but by means of unified organization under effective leadership.

The city of Vienna, under its liberal government, has created a centralized public health system which already has accomplished remarkable results. Health direction is carried out by district supervisors, each of whom ascertains at regular intervals the health conditions in each family in the district. Not only does this supervisor recommend to the family what needs to be done; he has also in certain fields the right of enforcement for which our own public health official so often longs in vain. The Viennese child, for instance, who is found to have a physical or mental defect needing curative treatment is promptly taken over by an appropriate institution. School physicians and nurses coöperate in reporting problem cases and physical defects to the district supervisor, and prompt study and treatment of these under government agencies is a matter of routine. In spite of the poverty of the Viennese, the level of health among their children is today exceptionally high.

Within 8 years, Vienna has reduced the incidence of congenital syphilis by more than one-half. Government supervision and education have resulted in practically all pregnant women receiving Wassermann tests and treatment when indicated. Today over 70 per cent present themselves for this service before the 4th month of pregnancy.

Soviet Russia is demonstrating in a similar way the effectiveness of active, centralized health control. Within less than 10 years, over the whole of Russia the infant mortality rate has been reduced by more than one-half, in spite of the poor means of communication, the ignorance of the people, and the size and varied nature of the country.

Before the institution of the new public health régime, Russia's rural districts had no public health service. There was in these districts only 1 physician to every 20,300 peasants. Today the centralized government health service has arranged for a more equable distribution of physicians and has so organized the work of clinics, nurses and social workers that 5 times as many rural communities now receive a fair degree of public health service as in 1918. This extension of medical work into the rural districts so rapidly and efficiently

accomplished under centralized government control is of special interest to us in this country, where many of our own rural communities present a crying need. President-elect Hugh S. Cumming estimates that 75 per cent of our rural districts are without adequate public health service. Lacking centralized direction, the medical profession to a constantly increasing degree is congregating in the cities. It is hard to see how any agency short of a centralized and powerful health organization will be able to remedy this condition.

The superior efficiency of such an organization acting comprehensively with government authority is apparently recognized throughout Europe. Most of the important European countries have taken steps in this direction, France being, I believe, the latest to adopt such a plan.

In this country, as has also been the case in European countries in the past, the idea of government control of medical work arouses bitter opposition. The advantages, however, of the unified system can hardly be denied and its possible disadvantages may perhaps be overestimated. Most often, one hears the statement that State medicine would kill ambition and reduce to an inferior level the quality of medical work. In those countries which have adopted the new system I have been unable to find any evidence of any such deterioration. Why should it deteriorate? Those men who make the real contributions to science are almost without exception the ones whose ambition is scientific, not pecuniary. Much of the best public service is performed by men whose interest is in the work itself and who gain nothing from it in a material way. Rather than quenching scientific ambition, I am inclined to believe that the new system gives it greater opportunity. Relieved of the distraction and worry of working up a paying practice and of attempting to collect bills, the physician is in a far better position to pursue an ambition for research or for community health leadership.

In a prosperous nation like our own the physician under a government health program might expect for his services: an adequate salary, an old-age pension, funds and equipment for research, and a periodic leave of absence for postgraduate study. I am inclined to believe that the medical men whose ambition could not flourish under such conditions are those whose loss would be no great blow to the profession.

Be that as it may, our present dual system is failing to accomplish many things which are being accomplished elsewhere as a result of unification. Our public is becoming aware of this fact and is dissatisfied. Our public health officials find their hands tied in many

ways, and are also dissatisfied. If unification and efficiency can be accomplished without changing our system, all concerned will welcome the solution with joy. One fact remains, however, uppermost and insistent. Whatever adjustment may be necessary, whatever sacrifice of personal inclinations—unification of aim, efficiency of public health service and a tremendously increased effectiveness of preventive work must in some way be accomplished.

Administrative Control of Commercial Blood Donors

FOR the first time, so far as we are aware, the practice of commercial blood donors and blood donor agencies has been taken under administrative control by the health authorities, the pioneer step being due to the Board of Health of New York City. Hereafter, in that city, no commercial blood donor or blood donor agency may operate except under a permit from the Department of Health, and subject to the regulations adopted by the Board.

This is a commendable advance, for the keen business competition between some of the agencies was beginning to result in such wholly unsatisfactory and even dangerous conditions that the practice of transfusion was seriously threatened.

Investigations carried on in New York City showed that in some cases the blood of donors was incorrectly grouped, and instances were discovered in which the donor's blood gave a 4 + Wassermann reaction. In some cases excessive quantities of blood were withdrawn without the knowledge or consent of the donor, and too frequent use of a particular donor was permitted.

Judging by the regulations adopted by the New York City Board of Health the occurrence of such evils should hereafter be impossible. The tests for blood grouping are entrusted only to recognized laboratories, the luetic tests are made by the laboratory of the Department of Health. No donor is accepted for registration by the Department of Health until after a physician's examination shows him to be in good health, special attention being paid to syphilis, malaria and other communicable diseases. Each registered donor receives an official pass book containing his photograph and personalia, together with a record of the blood group to which he belongs. A record of every transfusion in which this donor participates must be entered in this book, as must also a record of the regular medical examinations prior to transfusion which the regulations demand.

In its announcement of the new requirements, the Department of Health acknowledges the coöperation of the New York Academy of Medicine, The County Medical Societies, and various eminent authorities, including Dr. Karl Landsteiner, in the preparation of these regulations.

Public Health and Private Practice *

GEORGE C. RUHLAND, M. D., F. A. P. H. A.

Commissioner of Health, Syracuse, N. Y.

WHY can there not be more harmony and good-willed coöperation between public health agencies and the private practising physician?

It may be considered imprudent and in questionable taste to suggest that all is not well in the affairs of the family of the medical profession. However, it is already an open secret, and therefore no betrayal, that public health and private practice are living in more or less strained relationship, and that there have been family rows.

It seems much wiser, under the circumstances, to deal frankly with the situation, examine the conditions that apparently lead to friction, and discuss them dispassionately with a view to peaceful settlement—rather than allow matters to drift until irreparable damage is done.

There should be good will, harmony and coöperation between public health and private practice, of course. Are they not both concerned in the protection of public health? do they not speak the same language? employ, more or less, the same technic? and recruit their membership largely from the same professional groups? Is their work not dependent upon one another?

All this is admittedly true. All this may be considered as good reason for team work. However, the facts are—as practically any health officer must admit if he is perfectly frank about it—that his own service, or that of public health in general, has come at some time or other under the criticism, at times bitter, of his professional colleagues in private practice.

Dr. Olin West, who, as Secretary of the American Medical Association, unquestionably speaks advisedly, has with admirable reserve this to say on the relationship of public health to private practice: "There is a certain element of the medical profession inclined to withhold its coöperation with departments of health.¹ There are reasons for this, and some of them not in any manner due to faults of the medi-

* Read before a Special Session on Preventive Medicine of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 29, 1930.

cal profession, but originated in certain official actions taken by the departments of health themselves."

It would seem idle, or worse, with such evidence to deny the existence of difficulties, or to try to waive them as inconsequential hospital corridor gossip of a disgruntled few. Nor does a policy of "Let us not talk about it," in the hope that conditions will right themselves seem sound and reasonable. We might as well believe that a policy of earnest wishing, or Couéism, will solve the cancer problem for us.

The very persistence of symptoms of dissatisfaction should be a warning that there is a real and deep seated malady. As physicians and health officers, we should bestir ourselves to determine the cause or causes of the trouble, and then proceed to corrective or curative measures, if possible. An inquiry must be an obvious first step in the direction of better understandings, and better working relationships.

The reason for the cry of distress and protest that comes from the ranks of the medical profession seems fairly clear. It is a question of bread and butter, or a fair chance at making a living. With an average annual income of scarcely more than \$3,000⁷ the practitioner of medicine finds himself poorly compensated for his 6 or 7 years of preparation and training. He finds it difficult to meet his overhead for office equipment and necessary running expenses; to provide for his family, to give his children the education he wants for them; to carry insurance; and yet save enough for the rainy day.

Is public health service alone to be held accountable for the disadvantageous position in which the average practitioner of medicine may find himself? Hardly. The economic factors that distress the medical profession manifestly affect others as well, and call for a new adjustment all around. Cannot part of the profession's difficulties be explained by the fact that, "We live in an economic age, but medicine as an organized profession does not fully realize it?"⁸

Cannot part of the economic difficulties of the medical profession be corrected by changes in the present methods of medical training? Cannot some of the neglected fields of therapy be regained for the profession? Cannot medical ethics unbend to permit the specialist in medicine to announce frankly his particular field of service to the public? Cannot group medicine,⁹ help solve the cost of overhead, and offer more efficient service at a lesser cost—especially when operated in a manner worked out by Crampton?¹⁰

Perhaps it may seem somewhat forced, in a paper that proposes to discuss the relationship of public health and private practice—and more particularly factors that apparently are causing difficulty between these two—to suggest a line of inquiry that might prove helpful

to the medical profession. It certainly is not done with any intention of diverting attention from the main issue. It is done, however, frankly for the express purpose of making it clear that there are obviously quite a number of other causes that have to do with the economic difficulties of the medical profession, and that—whatever irritation arises therefrom—this cannot be solely charged against the activities of health departments.

There is a gradual encroachment in various directions in the field of medical practice, which takes the form of group practice, public clinics, pay clinics, organization of hospitals and medical service by great corporations such as the railroads and industries, student health services in the universities, benevolent societies with hospital privileges; and public health is constantly extending its range.³

This listing of factors that unquestionably affect the interest and income of the individualist in medicine leaves out self treatment by the public, the activities of quacks and various cults; and does not mention the fact that a large portion of the population finds it difficult, if not impossible, to meet the cost of medical care. There can be no question, however, that progress in preventive medicine, and particularly in the control of the communicable diseases, has profoundly affected the income of the practising physician. "The world of medicine is today in the throes of a far reaching readjustment in which even the wisest are sometimes at wits' end."⁴

The days when a few cases of typhoid fever in the fall of the year carried the practitioner of medicine comfortably through the winter are over. Smallpox is going, so are diphtheria, malaria, yellow fever, plague, hookworm, and the summer diarrheas of infancy. The list of communicable diseases which the physician is called upon to treat is growing smaller, and with this his income from these sources. This may be lamentable from the physician's point of view. However, can any other course be justified than one that will seek prevention where prevention is possible? Is it not for the medical profession to adjust itself to the trend of the times and learn to shift, where possible, from curative medicine to preventive practice?

Health departments cannot neglect to urge and seek preventive means for the protection of the public health. After all, health departments belong to the public and are expected to be operated in the interest of all the public. Increasingly the public realizes that life and health represent economic assets; that sickness is very expensive; and that the cost of sickness, disability and premature death ultimately falls back as a burden upon the taxpayer. It is not to be wondered at, under the circumstances, that public opinion becomes more and

more insistent in demanding health protection as a community service. If any one doubts this, let him get a sample of public opinion by reading "A Patient Looks at Doctors," *Harper's Magazine*, November, 1930.

Does this mean State medicine? Who knows? It may be well to consider what Glenn Frank has to say on that point: "State medicine will not come if doctors generally, display, in years ahead, adequate sensitiveness to social values and adequate statemanship in meeting social needs."

In the meantime what can be done to lessen friction between public health and private practice and to promote better coöperation? It would seem a good beginning for the health officer to abandon the traditional police power attitude in dealing with the medical profession, and to remember that much more can be accomplished ordinarily by good-willed coöperation based upon understanding. Unquestionably much of the friction between public health and private practice results from misunderstandings. We have not always taken time to explain our plans and actions.

As for the special activities of health departments that have to do with what may be called "medical service," these can be carried out, it would seem, without friction, if it is fully understood that they are exclusive of the free treatment for the indigent sick, essentially and entirely of an educational character.

Health education, that is advising the public in general terms on matters of personal hygiene, and urging them to go to the physician at the earliest evidence of symptoms, or for periodic health examination, surely should not be met with rebuff or criticism by any practitioner of medicine.

As for the so-called "clinic services," at which expectant mothers are advised, where infants and preschool children are examined and advice for their general care is offered, these activities should remain free from any objection, provided doctors are given to understand that these after all constitute merely an educational approach by which departments of health mean to train the public in the habit of coming for periodic examinations, and for the purpose of keeping themselves under medical supervision.

It is—and this should be made very clear—in substance no different finally from school medical inspection, which as a public service surely has demonstrated its value, and which has also served to refer more children to the physician than came to his attention formerly.

Along these lines a good-willed coöperation service should be possible that will satisfy public interests and be of benefit to the practising physician as well.

REFERENCES

1. Address before the 88th Anniversary Meeting of the Wisconsin State Medical Society, Madison, Wis., Sept., 1929.
 2. Dublin, Louis I. The Cost of Medical Service, *Harper's Magazine*, Nov., 1927.
 3. Wilbur, Ray Lyman. Medical Progress in an Economic World—address California State Medical Society, San Francisco, Calif., July, 1928.
 4. Collins, Joseph. Group Practice in Medicine, *Harper's Magazine*, July, 1928.
 5. Crampton, C. W. Periodic Health Examinations. Committee on Health Examinations, Medical Society of the State of New York.
 6. Frank, Glenn. Fellowship address before convention of American College of Surgery, Chicago, Ill., Oct. 18, 1929.
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Deaths of Two Men Notable for Their Public Health Work

WALDEMAR HAFFKINE, for many years bacteriologist to the Indian Government, died at Lausanne on October 26, in his 71st year. He was a Russian by birth, and was graduated from the University of Odessa in 1884. In 1889 he was invited by Pasteur to become an assistant at the Pasteur Institute. After 4 years there he was asked by the Government of India to devise methods for the arrest of cholera, and became attached to the Government Laboratory at Bombay, which in 1925 was named the Haffkine Institute, in his honor. He is best known to bacteriologists through his preparation of vaccines against Asiatic cholera and bubonic plague, both of which have been used with considerable success. Unfortunately a terrible accident due to gross neglect of ordinary precautions occurred at Mulkoyal in connection with the latter, which for a time cast a shadow over his work. Haffkine was entirely cleared of all responsibility, and it is now generally accepted that his vaccine reduces the mortality from plague when used in an epidemic. He will always be remembered as a pioneer, and as having contributed greatly to the control of two of the most deadly diseases known to man.

Christian Eijkman died at Utrecht soon after. To him we largely owe the foundation of our present knowledge of deficiency diseases, through his discovery of the ill effect produced by polished rice. In 1929, in recognition of his discoveries, he shared the Nobel Prize in medicine with Sir Gowland Hopkins. He was a Hollander by birth, and obtained his education at the University of Amsterdam, where he was for some years Assistant Professor of Physiology. In 1883, he went to the Dutch East Indies with the Colonial Army, but after 2 years was invalided home and began work as a bacteriologist. Three years later he returned as a member of a commission to study beriberi. The commission concluded that the disease was infectious, but Eijkman remained in Batavia as director of the new laboratory for bacteriology and pathology, and continued his investigations. He fed fowls on scraps from the military hospital, which consisted largely of cooked polished rice. The birds developed an obscure paralysis, the cause of which was also accidentally made clear by the refusal of a newly appointed director to give the scraps to Eijkman for chicken feed. They were then fed rice in the husk and soon recovered. Eijkman identified this polyneuritis with beriberi of human beings. Since that time, many experiments all over the world have demonstrated the truth of his conclusions.

He made many other studies on human metabolism. Soon after his return home he was appointed Professor of Hygiene at the University of Utrecht, and held this position until 1928, when he was in his 70th year. M. P. R.

Responsibility of the Personal Physician to Preventive Medicine^{*}

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MY contribution to this conference is based upon personal observations and experience gained in taking a civic interest in public health affairs for the last 25 years, while engaged in the private practice of medicine, and though I have been the president of a county voluntary health association for the last 12 years and the president of my county's Board of Health, I have never had any closer connection with the administrative part of public health. Therefore, I shall speak from the viewpoint of the family physician and his relation to public health. I have said all this so that I may not be misunderstood.

When public health began to mean more than essentially a police function, a new obligation was imposed on the profession of medicine, and the doctor became the most essential factor in the final distribution of public health functions; and though the term today includes many other factors, such as social welfare, mental hygiene, industrial hygiene, old age pensions, pure food laws, control of bovine tuberculosis, school health work, voluntary agencies, foundations and health departments, the doctor is, after all, the only authoritative source of health information, and the most essential factor when taken in cooperation with all other agencies.

Let us remember that in the beginning, public health was advocated and administered by individual practitioners of medicine and that it has always been an activity of the medical profession. The constitution of every general medical society states two essential objects of organization—one, the advancement of scientific medicine, the other, the betterment of public health.

We should also remember that although discussion of the need of official organization for the administration of public health began as long ago as three-quarters of a century, most health departments, as functions of government, are less than 25 years old. Therefore, we are dealing with a comparatively new relationship of medicine and

^{*} Read at a Special Session on Preventive Medicine of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 29, 1930.

public health. The general profession of medicine is slowly modernizing its relationships to the various health influences. Medicine has been busy curing disease, and while it slowly slipped away from close contact with public health administration, it is now slowly but steadily coming back to a coöperative relationship with all of the factors of modern public health.

Social trends brought out social needs. Laymen began to try to improve the health situation. Lay health organizations followed, and later foundations began to study health problems. Medical errors were sometimes made; emotionalism sometimes overshadowed diplomacy; laymen assumed knowledge of medicine that they did not have. There seemed to be developing an interference with the private practice of medicine—the personal relationship of doctor and patient—and out of it all grew the fear of a disturbance of personal economics, a sensitive spot to every human being. A doctor often has all the wealth that he possesses tied up in his education and his equipment to practise medicine; he has personal economic obligations just as anyone else has; he began to feel that a great emotional appeal was not only unsound but that there was an added danger of the giving of medical service without compensation. All this is mentioned for the purpose of showing the reason for the general relationship of the medical profession to public health that existed until within a few years.

In recent years mankind has more or less changed front toward disease because of the public knowledge of preventive medicine, so that the world began to look more and more to the only authoritative source of medical knowledge as the important factor in its administration and final distribution. A most important situation which confronts the medical profession today is whether the relationship work in organized medicine in its efforts to correlate health influences and to coöperate with health agencies—so that a health program can be built up in which every interest may know its limitations, responsibilities, and differences—is to be mutually respected.

Medicine is in a period of transition as to its relationships to the various factors in public health and to the preventive medicine era. The leaders of medicine see clearly the need for a new relationship.

I have made a comprehensive inventory of the health activities in every county in New York State and the relation of the medical profession to them during the last 5 years, while serving organized medicine as vice-president of the State Medical Society 1 year, trustee 3 years, president-elect 1 year, and now president. A part of the general profession has not yet seen this transition, and not having realized it, has been uninfluenced by the great changes in social conditions and

social needs. While some of the profession are apathetic, the medical profession generally is not at the present time so indifferent toward the social trends of the time and the resulting needs as many organizations appear to believe.

I do not believe that medicine is under siege. I am afraid that I do not agree with certain distinguished medical men when they say that there are intended onslaughts on medicine. Medicine is too essential to human welfare for this to be thought of seriously.

There is an increasing participation of the laity in the public health field, represented by organizations and foundations. The only reason for it is that there are unsolved health problems. Foundations have pioneered in social medical research. They have brought to light unsolved health and medical problems. Their work is a public asset, and in coöperation with the medical profession an asset to the medical profession. The work of the foundations is now a force that commands public confidence, and public opinion is beginning to ask that the health problems found shall be met.

While the world looks to the medical profession to give the preventive health service and medical care that it needs, it will accept other sources of health service if it must. Voluntary organizations and foundations naturally think along different lines from the medical profession. They are hampered neither by tradition, professional conservatism, nor a code of ethics; but an understanding of the differences, to be mutually respected, is growing so fast that one can look for full coöperation and a definite and acceptable relationship in the near future.

While one may still hear in certain places that the State has no right to do certain things—for example, hold clinics for the immunization of children against disease where the profession has not yet offered to do it—one does not hear an answer to the question—"How long must the State wait before protecting from disease its citizens for whom it is responsible?" The leaders of medicine today are asking their own profession to offer a public health program instead of waiting until other organizations are forced to do so. They are asking their profession to make use of the principle of conference in developing plans to meet health problems and then to coöperate with other organizations in the distribution of preventive measures. They are advising the profession of medicine that in no other way can the best results be obtained.

While the medical profession is essential in the solution of the unsolved health and medical problems, and while the family doctor is the most essential factor in their final distribution, this alone will not solve

the problems. The medical profession is not organized for the purpose of public health work distribution and probably never will be, yet it is its duty, and it is rapidly assuming it, to furnish all professional service and to assist in the policy of public health administration.

While everyone will, sooner or later, realize that the practice of medicine is the foundation of public health, and that public health is never separate from the practice of medicine, it is the duty of the State to furnish the equipment for public health practice and to provide for the expense of administration by general taxation. This cannot be charged to organized medicine because there is no way of making up the deficits. The profession requires the aid of government, the machinery of a health department, the educational capacity of lay associations, and the research work of foundations—all under expert medical guidance. Then each factor will be a complement to the other.

A doctor has nothing to lose in practice and a good deal to gain by coöperation with any sound preventive health program. His practice will become larger just in proportion as he adopts preventive health work. The medical profession as a whole has an opportunity to assume guidance of public health work simply by coöperating with other health agencies.

The excess zeal of voluntary organizations and their influence on governmental agencies, the giving of technical service, has aroused the fear of State medicine and the economic interference with the practice of medicine, and accounts more than anything else for the apparent cleavage between public health and the medical profession. It is fading just as the understanding grows of the real relationships between the various factors entering public health administration.

There is a new force in organized medicine in New York State known as Public Relations. It is very rapidly influencing medical opinion and formulating basic principles of relationship between the medical profession, official and unofficial agencies, and the health departments of the state government. The Medical Society of the State of New York has created a standing committee to direct it, and has been careful in the selection of the members. They are men of civic instincts who have been trained in the affairs of organized medicine and, therefore, have a conception of the problems that confront the profession of medicine and are likely to increase in the next few years. They have a conception of the obligation of the profession of medicine to advance its science; to provide for present public medical needs and their expansion as time goes on, and at the same time to maintain the virility of the medical profession.

This committee is undertaking to have adopted the principle of

conference in reaching a conclusion regarding any local health program, and then to establish a coöperative relationship in its administration, with an understanding of the responsibility of each factor. Medicine cannot honestly complain if its position becomes somewhat unsatisfactory in the eyes of the public, if it does not do this.

The Public Relations Committee of the Medical Society of the State of New York undertook to have a public relations committee organized in every county society, and this has been done. It has taken 3 years of steady effort to bring this about. The committee then undertook to have each county committee make a survey of the health activities of its county and the relation of the local profession to them. We believe that this committee is doing the kind of work that will solve professional problems, and make the profession equal to official agencies and the State in its effort to meet its responsibilities for the health of its dependents.

Serving as a member of the New York State Special Health Commission has given an opportunity to see the great change today in regard to many health interests. It must be a fundamental, social change to involve as many different groups as are represented on that commission. It includes as widely separated interests as the Department of Labor, the League of Women Voters, industrial hygiene, workmen's compensation, social welfare, old age pensions, the State Department of Health, and organized medicine. It includes every department of the state government having any bearing on health and all voluntary health organizations. The study is based upon an enlarged conception of the public health problem. It is in line with the changed front of all mankind toward disease, and perhaps the reason for this change lies in the present public character of medicine, knowledge of what can be had from health service, and such things as better living, shorter hours of labor, and more education. All these things make imperative a new relationship of the medical profession toward the broader aspects of medical practice. No activity of the New York State Medical Society is increasing so rapidly as Medical Public Relations, and the reason for it is that it meets a general professional need.

The medical profession should remove any doubt of its relation to preventive medicine in order to improve its position in public opinion. Medicine understands today better than ever before the favorable influence that it can have on all public health questions.

During the last few years of intensive observation, I have often wondered why so many of my profession lacked interest in some of our relationships to public health problems; why they were unconcerned

or sometimes mildly opposed to better organization for the administration of public health; and why they were sometimes opposed to other organizations whose purpose was the betterment of public health, which is also one of the two essential objectives of organized medicine. This is all being corrected now by the educational activity of a carefully selected and well trained committee of the State Society.

Medicine is a social function. It has always been so. It is a community obligation. It is one of the features of community life. To oppose or to fail to join with community effort in any local community is letting go to waste a resource that we need and that we could make use of to the betterment of our own profession.

Of course, we must expect that philanthropists and foundations will continue to advance health and medical projects. It is proper that they should do so. If civic effort should be blotted out of medicine, it would be as disastrous as if civic effort were blotted out of government. Government does not usually initiate public improvement but carries out that for which public sentiment asks. A long training in the civic work of a Chamber of Commerce enables me to state that many world problems are being solved in this way today that would not otherwise be solved. It is the civic duty of medicine to give guidance to these projects and to show whether they are sound.

If laymen had always taken the viewpoint that health effort had a definite relationship to the practice of medicine, there might never have arisen an apparent cleavage. There has been in the past a good deal of activity without asking for medical conference, and for this reason the medical profession has lacked some interest in public health effort. Under the leadership of the Public Relations Committee this situation in New York State is disappearing. The two important factors in public health, the medical profession and the health organizations, now realize that the gap between the medical profession and public health administration is just about as wide as that between health organizations and medicine, but an understanding is developing that is already diminishing the difference.

In conclusion, all proposals to distribute health and medical service, regardless of the ability of the recipients to pay for it, will socialize medicine, and to this the medical profession rightfully objects.

The various agencies of health departments, voluntary agencies, the State, and the medical profession can be developed into an efficient organization, to the mutual advantage of the public and the medical profession. This is one of the important problems in health work today as well as in medical public relations.

The Medical Society of the State of New York is working out this

problem by the use of the principles of conference and coöperation and relationships.

Doctors endorse mass preventive practice but they are dependent upon other organizations than their own for its administration. They distribute preventive measures to individuals—one doctor to one patient at a time. The health officer must organize and provide for publicity for mass or semi-mass service.

There is growing in the minds of the public a knowledge that disease can be prevented to an extent, if diagnosed early enough to attack it in its incipience.

Many health influences are attacking the health problems that have not been met. Times are changing, and the doctor is changing with them. He is changing from the curing of disease only to the inclusion of preventive practice. The change is slow but it is as fast as any scientific body would move.

National Advisory Health Council Appointed

MEMBERS of the National Advisory Health Council, created by act of Congress in April, 1930, as an advisory body to the National Institute of Health, were recently appointed as follows: Dr. Simon Flexner, director, Rockefeller Institute for Medical Research, New York; Dr. Mazzyck P. Ravenel, professor of medical bacteriology and preventive medicine, University of Missouri School of Medicine, Columbia; Dr. Milton J. Rosenau, Charles Wilder professor of preventive medicine and hygiene, Harvard University Medical School, Boston; Dr. William H. Welch, Johns Hopkins University, Baltimore; Dr. Waller S. Leathers, dean and professor of preventive medicine and public health, Vanderbilt University, Nashville; Dr. Haven Emerson, professor of public health administration, Columbia University College of Physicians and Surgeons, New York; Dr. Samuel C. Lind, head of the department of chemistry, University of Minnesota; Dr. William H. Howell, director and professor of physiology, Johns Hopkins School of Hygiene, Baltimore; Dr. C.-E. A. Winslow, professor of public health, Yale University, and Dr. Alfred Stengel, professor of medicine, University of Pennsylvania School of Medicine, Philadelphia.

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DROUGHT AND MALNUTRITION

IN spite of the fact that the newspapers have kept the country informed as to the drought of the summer of 1930, and the continued deficiency in rainfall during the present winter, there still seems to be a lack of appreciation of the matter, especially so far as the consequences are concerned.

Some 21 states have been affected more or less seriously, many of them having already suffered losses which cannot be made up until the crops of 1931 are harvested, even supposing the conditions will be favorable from this time on. In a number of states the fields of alfalfa and winter grain have either been injured or seriously threatened by the lack of moisture, and there is even danger of the death of trees. Only abundant precipitation in the near future can save these areas in the matter of crops and food.

From the standpoint of the readers of this *Journal*, the influence of conditions on the health of the inhabitants, particularly children, is the chief point of interest. At least 2 state health officers and the Surgeon General of the U. S. Public Health Service, have given testimony concerning medical conditions in the drought-stricken areas and the suffering which has resulted from a lack of medical attention and supplies, for which a prompt appropriation of 3 million dollars has been asked, to be expended by the Service. There is evident already undernourishment of children, and the menace of typhoid fever seems to be greater than for a number of years. In many areas the farmers

have not water either for their stock or for themselves. Water is being hauled from runs, creeks and springs to fill depleted cisterns and wells. Since the majority of these sources are not protected, the danger is evident. The demand for antityphoid vaccine as reported by manufacturing houses and by state laboratories has been much larger than usual, and county health officers are advising its wider use.

In some parts of the country, notably Arkansas, it is stated that the incidence of pellagra has increased. It will be well to remember that the late Dr. Goldberger pointed out the prevalence of the M. M. M. diet (meat (pork), molasses and meal) in the farming sections of the South, to which he attributed the increase in pellagra after the Mississippi floods a few years ago. The condition is much the same now as then, though perhaps exaggerated. Matters have been made worse by the lack of food for animals, and there is a practical certainty of a depletion of the already deficient milk supply. There is no doubt that the assisting agencies throughout the country will ship in milk and milk products to the full extent of their ability.

The health officers of the various states and communities are alive to the problems confronting them. The citizens to a great extent are unable to help themselves, through the loss of crops, the failures of banks, and the tying up of public funds. It is a time when not only competent advice, but assistance, is badly needed. Infants and children must be protected against undernourishment, the effects of which may persist throughout life.

PULMONARY TUBERCULOSIS OF BOVINE ORIGIN

ONE seldom now sees discussions of bovine tuberculosis in relation to human health, and the newer generation of health officers and public health workers has apparently forgotten, or never heard of, the bitter controversy which raged over the matter of human susceptibility to the bovine tubercle bacillus. All of them advocate the pasteurization of milk, but such things as undulant fever seem to be more prominent in their minds today than the danger of bovine tuberculosis. As a matter of fact, bovine tuberculosis in human beings seems to have greatly decreased, though we have few statistics based on its incidence before and after pasteurization. Where these figures are obtainable, they are in favor of pasteurization. It is perhaps superfluous to add that the tuberculin testing of milch cows is widely practised and many of our cities have ordinances requiring it.

Some of us can remember Koch's last stand on the question when the English and German Commissions had both reported that tubercu-

losis in cattle was a fairly frequent source of the disease in human beings, especially young children. At the Conference in Camera, which left a very bad taste in the mouths of many scientific men, Koch's final refuge was the statement that it had never been demonstrated as the cause of pulmonary tuberculosis, and when he was confronted with the statement that bovine organisms had been found in human sputum, he insisted that it must be shown that the patient had not eaten butter or any other food which might have contained the germ.

Certain English authors have shown a remarkable tenacity in pursuing this line of work, and we now have a report¹ from one of the most prominent English bacteriologists which proves conclusively that the bovine bacillus can and does cause pulmonary tuberculosis.

In England, 3 of 327 patients suffering from phthisis (slightly over 1 per cent) expectorated only bacilli of the bovine type. In Scotland, 18 of 468 (approximately 4.5 per cent) have been found, 17 of whom gave only the bovine organism, while 1 gave both human and bovine. Outside of these 2 countries, 926 examinations of sputum have been reported, all of which showed the human organism.

A majority of the cases showing the bovine type of organism gave clinical histories which indicated the alimentary tract as the portal of entry. Eleven patients have died, and on 2 autopsies were made, in each of which cavity formation was found, and pure cultures of the bovine organism obtained from the lung and other lesions, proving that the organisms found in the sputum had their origin in the lung disease. Autopsies on 4 cases of generalized tuberculosis with cavity formation due to the bovine organism are quoted, the anatomical evidence in 4 of the 6 post-mortems indicating the alimentary tract as the portal of entry. In 2 the evidence was inconclusive, but pointed to the alimentary tract rather than to the respiratory. In no case was there a family history of tuberculosis, nor any evidence that the disease had been contracted from a previous case, so for the present we can say that the cow is the only source of bovine infection in human beings. Other cases of fatal generalized tuberculosis in children due to the bovine organism are reported in which the anatomical evidence pointed definitely to the respiratory tract as the portal of entrance.

From the above, it can be stated positively that while rare, pulmonary tuberculosis, or ordinary consumption, may be due to the tubercle bacillus of bovine origin, and like other forms due to this organism, in the great majority the infection enters through the intestinal tract.

The facts recited furnish one more strong argument for the pas-

teurization of all market milk, in addition to the commendatory efforts which are being made to eradicate tuberculosis from dairy herds.

Koch's stand in the matter was the one great blunder of a remarkable scientific career. One should not forget what Abram Jacobi said on the occasion: "It is of more importance to save the lives of babies than to protect the reputation of one great scientist."

REFERENCE

1. Griffith, A. S. *J. Path. & Bact.*, XXXIII, 4: 1145 (Oct.), 1930.

THE LUBECK DISASTER

WHILE it is probable that the true explanation of the Lübeck disaster will never be entirely known, the report from the German Federal Bureau of Health is of interest. The work was done by Professor Lange, and concurred in by Professor Neufeld, and Dr. Kirchner, of Hamburg. In the material which was available for study, were some remnants of the vaccine material which had been used, and a culture isolated from one of the infants who died of tuberculosis. From one of the vaccines, a virulent culture was obtained, while the growth from the other corresponded to BCG vaccine. The culture isolated from the dead child was apparently identical with strain H 29 of the Robert Koch Institute. The indications that the latter was used for inoculation is borne out by the fact that during part of the vaccination period there were many deaths, and at other times, very few, and not many severe illnesses. The explanation of reversion of type given by Petroff, of Saranac Lake, and Watson, of Canada, is regarded with skepticism.

The conclusion is that the accident in Lübeck was not due to the Calmette procedure as such, nor to BCG. It is regarded as "entirely probable" that there was a mixing of the virulent culture with the vaccine, through some error in handling.

The Federal Health Council holds the opinion that the whole question is so unsettled that general immunization of human beings, particularly when living bacilli are used, is for the present, ill-advised. In view of the Lübeck affair, it considers that the legal requirements regarding preparation, distribution and use of vaccines of all kinds, must be extended and insisted upon.

REFERENCES

1. Berlin Letter, *J. A. M. A.*, 96, 4: 283, 1931.
2. Berlin Letter, *J. A. M. A.*, 96, 5: 372, 1931.

ASSOCIATION NEWS

CHARLES J. HASTINGS

IN the death of Dr. Charles J. Hastings on January 17, not only Canada, but the world has lost one of its outstanding teachers and practitioners of public health.

He joined our Association in 1911, became a Fellow in 1922, and was elected to Honorary Fellowship in 1926. He was the 46th President of the Association, having served in 1918.

Few members of our Association have endeared themselves to the membership as did Dr. Hastings. A hard worker and deeply interested in the affairs of the Association, he was always ready for any task, however difficult, and took prominent part in one of our reorganizations made necessary by the great growth in membership and the addition of sections along various lines. He was a fluent speaker with a wide range of knowledge, which was always at the disposal of the Association. For several years past he has been failing in



CHARLES J. HASTINGS, M.D.

health and has spent a number of his winters in Florida.

While mourning the loss to our Association, we extend to his family and associates our deepest sympathy.

WESTERN BRANCH A. P. H. A. MEETING IN SEATTLE

MAY 28 to 30, 1931, have been chosen as the dates for the Western Branch Meeting in Seattle, Wash. E. T. Hanley, City Health Officer of Seattle, is Chairman of the Committee

on Local Arrangements. The Olympic Hotel will be official headquarters. A list of hotels and rates will be furnished by the local committee to Western Branch members.

NEW MEMBERS

Health Officers Section

Dr. J. U. Bedard, Amqui, P. Que., Health Officer, Metapedia County
Dr. A. Belanger, Levis, P. Que., Health Officer, Levis County
Henry H. Bishop, M.D., Jena, La., Director, La Salle Parish Health Unit
James B. Fish, D.D.S., Buffalo, N. Y., Member, Board of Health

Dr. Jos E. Germain, Rimouski, P. Que., Medical Officer, County Health Unit
Arthur M. Gibbs, M.D., Hamburg, Ark., Medical Director, Ashley County Health Unit
Harrison Gray, M.D., Norwich, Conn., Health Officer
Dr. G. Antoine Grondin, Lac Megantic, P. Que., Health Officer, Frontenac County
Raphael S. Hernandez, M.D., Lafayette, La., Director, Lafayette Parish Health Unit

Dr. J. F. E. Labrecque, Ste-Anne de la Pocatiere, P. Que., Health Officer, Kamouraska Co.

Dr. J. Armand Patenaude, Ste-Martine, P. Que., Health Officer, Health Unit of Chateauguay-Laprairie-Napierville

Luc Pelletier, M.D., Thetford Mines, P. Que., Medical Officer, Megantic County

Francois F. Rougon, M.D., New Roads, La., Director, Pointe Coupee Paris Health Unit

Charles J. Scavarda, M.D., Flint, Mich., Assistant Health Officer

J. W. Weber, M.D., Woodsfield, O., Health Commissioner

Garland L. Weidner, M.D., Saginaw, Mich., City Health Officer

Laboratory Section

Beatram Feuer, Ph D, Chicago, Ill., Consulting Bacteriologist

Roy Fraser, M A, Sackville, N. B., Professor of Bacteriology, Mt. Allison University

C. M. Krug, Erie, Pa., City Bacteriologist

Norman H MacBeth, B S A, Hamilton, Ont., Director of Laboratory, Pure Milk Co., Ltd.

Donald J. MacKenzie, M.D., Halifax, N. S., Director of Laboratories, Dept. of Health

D. Roy Mellon, B Sc., LL.B., Youngstown, O., City Chemist, Health Department

Public Health Engineering Section

F. M. Brickenden, Winnipeg, Man., District Engineer, Dept. of National Health

Thomas G Croom, Concord, N. C., Supervisor of Water Works, Cannon Mills Co., Kannapolis, N. C.

Hung-Pin Tien, Ithaca, N. Y. (Assoc.)

R. G. Upton, Nacogdoches, Tex., Prof. of Biology, State Teachers College (formerly with State Dept. of Health Sanitary Engineering Dept.)

Child Hygiene Section

Calista Roy, Newtonville, Mass., Assistant Superintendent of Schools

Arthur C. Selmon, M.D., Battle Creek, Mich., Child Health Supervision work with W. K. Kellogg Foundation

Public Health Education Section

George F. Evans, M.D., Hopemont, W. Va., Supt., Hopemont Sanitarium

Dorothy G. Hard, Ann Arbor, Mich., Instructor in Oral Hygiene, Univ. of Michigan

Dr. Elphege Lalande, Lachute, P. Que., Medical Officer, d'Argenteuil County

Evelyn C. Moore, Huntington, W. Va., City Milk Inspector

Jane S. Napier, DuBois, Pa., Maple Avenue Hospital

George Thomason, M.D., Los Angeles, Calif., Chief, Surg. Dept., White Memorial Hospital

Public Health Nursing Section

Elaine G. Almen, R.N., Fairbury, Nebr., School Nurse

Ruth P. Carroll, Houston, Tex., Supervising Nurse, City Public Schools

Beatrice R. Goodrich, Brawley, Calif., School Nurse

Ida Klont, R.N., Phoenix, Ariz., Public Health Nurse, Maricopa County Health Unit

Marie A. P. Violette, R.N., Biddleford, Me., Public Health Nurse

Food, Drugs & Nutrition Section

Lott E. Bechtel, B.Sc., Lewisburg, Pa., District Milk Control Officer

Walter H. Grunge, New York, N. Y., Inspector of Foods, Dept. of Health

Industrial Hygiene Section

Dean K. Brundage, B.A., Cherrydale, Va., Associate Statistician, Public Health Service

Epidemiology Section

William D. Hickerson, M.D., Nashville, Tenn., Tuberculosis Clinician, State Dept. of Health

Louis E. McKee, M.D., Altoona, Pa., Chief, G-U Clinic No. 14

Unaffiliated

John E. Dowd, New York, N. Y., Assistant Director, Pease Laboratories, Inc.

William D. Riley, Nashville, Tenn., Reginal Consultant, U. S. Public Health Service

APPLICANTS FOR FELLOWSHIP

INDUSTRIAL HYGIENE SECTION: Lewis R. Thompson, M.D., Washington, D. C.

PUBLIC HEALTH NURSING SECTION: Ame'ia Grant, R.N., New York, N. Y.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

MEASLES CONVALESCENT SERUM

W. W. BAUER, M. D., F. A. P. H. A.

Commissioner of Health, Racine, Wis.

THE value of measles convalescent serum in prophylaxis and treatment of measles is firmly established and recognized by physicians and public health workers alike.

At the same time this valuable agent, at least in the smaller communities, has not been used to the extent which is desirable. This is due largely to the difficulties inherent in procurement and preparation of the serum to make it available at the time and in the place where it is most needed. There are two major factors which have created the present difficulty. One of these is a characteristic of measles epidemics, namely their periodicity. The second lies in the perishable nature of measles convalescent serum, a quality which it shares with all biological products.

Measles epidemics, as is well known to health administrators, occur at intervals of from 24 to 30 months. During each epidemic, it is possible to secure donors and to prepare convalescent serum from their blood. These donors are most numerous and most readily available at the height of the epidemic, whereas the most profitable use of the immune serum would be during the early stages of the outbreak. It is clear that measles convalescent serum gathered and prepared by any given community can under ordinary conditions be made available only when the time for its usefulness has largely gone by.

The perishable nature of the serum

makes any given batch of the product virtually useless after 6 months, or at least so reduced in potency that larger doses must be used, and even these do not give the desired assurance of successful prophylaxis or treatment. It is probable that any serum carried over from one epidemic to the next would be entirely without value.

These administrative disadvantages might be overcome by inter-community cooperation. Measles epidemics occur with fairly regular and predictable periodicity, but the cycle is not the same in all communities. There are cities which in 1931 are looking forward with apprehension to "a measles year." These communities know that lives will be sacrificed to this disease which might have been saved by prophylactic or therapeutic use of measles convalescent serum. In many instances, they will have no serum available, or only small amounts comparatively late in the course of the epidemic. If these communities could draw upon a common supply to which in turn they would contribute such quantity of serum as they might be able to procure, there would be a better chance all around of fighting the life loss from measles.

A cooperative plan for distribution of measles serum is therefore proposed and offered to health officers for their discussion and constructive criticism. The points outlined below are intended as a basis for discussion and not with any thought that they constitute a fully con-

sidered and workable plan. That there will be difficulties in its administration should be anticipated. Perhaps it will not work at all, and yet it seems to be worth consideration.

Briefly, the plan might be something like this:

1. A certain number of cities of approximately equal size might enter into a coöperative agreement which would stipulate that the health department in each city would locally procure all the measles convalescent serum possible.

2. All serum procured would be delivered to a central distributing point to be determined, and each city would be credited with the number of finished doses of convalescent serum manufactured from the blood delivered by that city.

3. Each participating city would, in turn, be privileged to withdraw, at the time of its greatest need, a number of doses equal to its credit and such additional number as might be available without working a hardship upon other participating communities.

4. The central distributing point would probably have to be a commercial antitoxin laboratory which would necessarily be a party

to the agreement. Such a laboratory would prepare the serum from blood received, keep a record of credits and debits for each participating community and the charges for this service could be distributed *pro rata* among the cities in proportion to the amount of finished product withdrawn.

As stated above, there will be difficulties of administration and it is entirely possible that the whole plan is not workable. On the other hand, if successful, a coöperative plan such as might grow out of discussion of the outline presented would, if practicable, greatly increase the availability of measles convalescent serum at the time and in the place where the greatest need exists and would greatly reduce the existing waste of this valuable material which now goes on because of the conditions outlined.

Pooled serum has already been considered in connection with poliomyelitis. The greater prevalence of measles, in comparison with poliomyelitis, seems to argue greater possibilities for the success of a measles serum pool.

LABORATORY

JOHN F. NORTON, PH. D.

AN UNUSUAL CASE OF CANINE RABIES

A. S. SCHLINGMAN, D. V. M.

Research Laboratories, Parke, Davis and Company, Detroit, Mich.

ON account of the 10-day observation period usually required for dogs suspected of being rabid which have bitten persons, the following case is of interest.

An adult male dog of mixed breed with no history of exposure to rabies was recently brought to my attention. This animal showed a tendency to conceal himself when an opportunity was afforded, and to bite when attempts were made to remove him. Inasmuch as these symptoms suggested the possibility of rabies infection, he was placed in separate quarters for further observation. No unusual symptoms were noted during the next 3 days other than a lack of appetite and a tendency to bark at anyone approaching the cage in which he was confined. On occasions attempts were made to bite objects thrust into the cage. There was also marked constipation.

During the next week the appetite and all body functions seemed normal and on the 10th day, the dog seemed only what would be termed a "cross dog." Nothing unusual was noted until the 15th day when there was again a lack of appetite and the development of slight nervous symptoms. There was also noted a tendency to chew the wires of the cage. This continued during the next day when it was seen that several of the incisor teeth in the mandible were broken off and that the gums and the mucous membrane of the lower lip were badly lacerated and swollen. No drool-

ing of saliva was seen on this or any other day during the dog's confinement.

On the 17th day the nervous symptoms had disappeared. The animal lay quiet most of the time but would rise when called. Next morning (the 18th day of observation) the dog was found dead. There was no evidence of convulsions which are usually seen prior to death from rabies.

Autopsy showed nothing unusual except a slight congestion of the internal organs. No foreign bodies were found in the gastrointestinal tract.

A diagnosis of rabies was made when Negri bodies were seen in smears made from the hippocampus major. To confirm this diagnosis, a portion of this part of the brain was ground in physiological saline solution and 0.5 c.c. of the suspension injected subdurally into 2 rabbits. One became paralyzed on the 14th day after injection and died 1 day later. The other remained normal for 12 days when beginning paralysis was seen, which was complete about 30 hours later. Death took place on the 14th day after injection.

Negri bodies were seen in smears made from the hippocampus major of each of these rabbits.

This case is reported because of the apparent lack of typical symptoms and also because it is evident that there may be cases in which the usual 10-day quarantine would not be sufficient to determine with certainty that a suspected dog was free from rabies infection.

A DEVICE FOR ASEPTIC DISTRIBUTION OF CULTURE MEDIA

W. L. MALLMANN

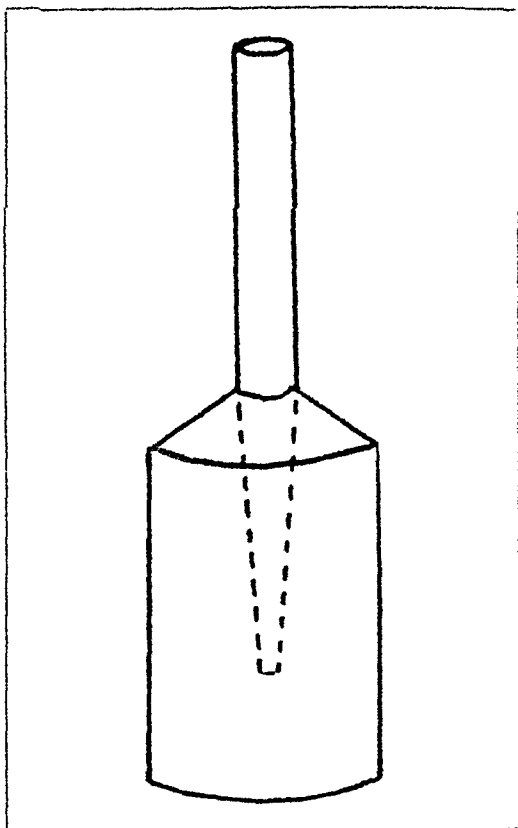
Department of Bacteriology, Michigan State College, Ann Arbor, Mich.

A NUMBER of devices for aseptic filling of test tubes with media have been perfected, hence the writer is somewhat hesitant in presenting another. However, the device herein described, although not totally new, is so much more convenient than those at present available, that its presentation seems justified.

The usual filling device consists of a covered funnel to which is attached a rubber tubing with a tapered glass tube tip, shielded by an inverted glass cone to prevent contamination reaching the glass tip or entering the tube during the process of filling. The funnel may be replaced by an inverted flask or bottle with appropriate fittings.

The glass shield device has never been a satisfactory arrangement due to difficulties of sterilization and breaking. The writer has substituted a metal apparatus as illustrated in the drawing (Figure I). In this simple apparatus, the tapered tip and shield are made in one unit. The device is made of copper, plated with nickel or chromium.

FIGURE I (actual size)



(Jr. article No. 57 (n.s.) from the Mich Agr. Exper. Sta.)

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Infant Mortality Decreased in 1929—The U. S. Department of Commerce recently reported that the infant mortality rate showed a marked decrease in 1929 as compared with 1915. The rate of 68 per 1,000 was the second lowest since the establishment of the birth registration area in 1915.

For the sixth consecutive year, Oregon led the states with the lowest infant mortality rate (48), and 11 states reached their lowest rates since 1915. These were Minnesota 51, Arkansas 58, New Jersey 60, Illinois 61, Massachusetts 62, Florida 65, Michigan 66, New Hampshire 68, Louisiana 74, Georgia 76, and South Carolina 91. Two states, Iowa and Maryland, maintained their lowest rates, attained in 1928.

With the exception of Colorado, Maine and Wyoming, the high infant mortality rates in 21 states were due to the high infant mortality among the negro population, especially in rural districts. The year 1929 saw not only the second lowest infant death rate since 1915, but also the lowest birth rate, which was 18.9. Oregon, besides leading the states with the lowest infant mortality rate, had the lowest birth rate (14.1) of any state during that year.—*J. A. M. A.*, 95: 1843 (Dec. 13), 1930.

Vital Statistics for London, England, 1929—The population of the County of London in the middle of 1929 is estimated by the Registrar-General to have been 4,430,000, including 12,100 non-civilians. This is a decrease of 37,700 of the civilian population since the middle of 1928. There were 70,089 births, equivalent to a birth rate of 15.8

per 1,000 as against 16.2 in 1928. This is the lowest birth rate ever recorded in London. The City of London has the lowest birth rate, 7.7.

There were 62,889 deaths, representing a death rate of 14.2 per 1,000 compared with 12.1 in 1928. This increase was due to the severe influenza epidemic and the epidemic prevalence of whooping cough which was mainly responsible for the rise of the infant mortality rate from 67 in 1928 to 71 in 1929. For the county as a whole, the death rate from whooping cough was 0.26 per 1,000 of the civil population.

The mild type of smallpox which invaded London during 1928 became established in many parts of the metropolitan area during 1929; no fewer than 1,908 cases were reported. The notified cases of diphtheria numbered 11,788 in the registration year, an attack rate of 2.7 per 1,000. The number of diphtheria deaths was 350 as compared with 399 in 1928, giving a case mortality rate for 1929 of 3 per cent.

A further diminution in the incidence of enteric fever was recorded; 351 notifications were received during the registration year as compared with 580 in 1928. The deaths in the calendar year numbered 45 as against 51 in 1928.

Fatal street accidents continued to increase in number, the total being 814 in 1929 as against 747 in the registration year 1928.—Report for 1929. *Brit. M. J.*, 2: 965-966 (Dec. 6), 1930.

Vital Statistics for Northern Ireland—During the quarter ended September 30, 6,513 births were registered in the 27 superintendents registrar dis-

districts in Northern Ireland. This number represents an annual birth rate of 20.9 per 1,000 of the estimated population. The equivalent figure for England and Wales is 16.6, and for Scotland 18.7. The rate in Northern Ireland is 0.2 above the rate for the corresponding period of 1929, and 1.8 below the average rate for the third quarters of the ten years 1920-1929.

There were 3,486 deaths registered during the quarter, or an annual rate of 11.2 per 1,000, being 0.2 above the rate for the third quarter of 1929 and 1.2 below the average rate for the third quarters of the 10 years 1920-1929. The urban mortality from the principal epidemic diseases recorded during the quarter was equivalent to an annual rate of 0.5 per 1,000 population. The death rate from these diseases for the remainder of Northern Ireland was 0.2.

Deaths from cancer numbered 330 or an annual rate of 1.06 per 1,000 compared with an average rate of 1.09 for the third quarters of the previous 5 years. The number of deaths of infants under 1 year of age was 34.9 or 10 per cent of the total number of deaths registered.—*Brit. M. J.*, 2: 976 (Dec. 6), 1930.

Annual Report of Surgeon General of Army, 1929—The general health of the army was satisfactory according to the report. The admission rate per 1,000 from diseases decreased from 586.53 for 1928 to 526.43 in 1929. With the exception of the rates for the years 1922 and 1925, the rate for 1929 was the lowest on record for the army. There was a slight decrease in nearly all classes of diseases, but the respiratory group, including influenza, was responsible for the greatest decline, as it was the most important cause of the increase in 1928. The death rate per 1,000 from all causes was 4.34, as compared with 4.10 in 1928. The increase

was due to a greater number of deaths from external causes. Although the rate from diseases decreased slightly for the year it was, with the exception of that for 1928 and 1927, higher than any other year since 1920, partly on account of the greater number of deaths from tuberculosis during the past two years as the result of the policy of holding enlisted men in the service for a longer period before discharge on certificate of disability than formerly.

The leading causes of retirement among officers were tuberculosis and chronic myocarditis, and among enlisted men, dementia praecox. The leading causes of noneffectiveness were gonorrhea, tuberculosis, syphilis, bronchitis, and injuries resulting from athletic exercises. The annual admission rate for the total male military personnel for venereal diseases was 48.33 per 1,000, which was 0.15 per 1,000 higher than it was in 1928; with this exception, the current rate is the lowest on record for the army. The total number of military personnel treated in hospitals and dispensaries during the year was 88,657, and the average number hospitalized daily, 6,613. The cost of maintenance of the 6 larger hospitals in the United States, exclusive of new construction, was \$5.21 per patient-day, a decrease of \$0.05596 per patient-day for the year.—*J. A. M. A.*, 96: 202 (Jan. 17), 1931.

The Epidemiology of Tuberculosis of Negroes—Of 10 million colored people in this country, approximately 25,000 die every year from tuberculosis. The falling death rate gives hope for the future but scant comfort at present, and in certain localities the death rate has increased rather than fallen.

An analysis by Sydenstricker, of the tuberculosis mortality in 1925 in the death registration area of the United States shows that for colored people, the mortality from the disease in both

men and women reaches a maximum between the ages of 20 and 24, when it is 4 times that of white people. The fall in death rate, more abrupt in colored women than men, is continuous throughout the remainder of life. The total death rate, unlike that of white people, is somewhat less in colored men than in colored women.

Statistics of the Metropolitan Life Insurance Company from 18,500,000 white people and 2,500,000 negroes show that the average death rate per 100,000 from 1925 to 1927 was for the white race 68.9, for the colored 203, a ratio approximately of 1 to 3. Negro children are more seriously attacked than white children, the ratio of deaths for the two races between birth and 15 years of age being 1 to 9.2, but from 15 up to 25, 1 to 3.9. As compared with figures of 1911 and 1913, the death rate from tuberculosis has fallen rapidly for both races, but the percentage of decline is somewhat less in each age group for colored than for white. The high mortality peak among colored females occurs in early adult life; among colored males, though the highest peak is at the same time, there is a higher proportion of deaths in middle life, as in the case of white males.

Postmortem observations suggest that the American Negro escapes tuberculous infection during childhood more frequently than white people and that he more often suffers in adult life from rapidly fatal tuberculosis with the characteristics of the first infection of white children.—Eugene L. Opie, *Epidemiology of Tuberculosis of Negroes*, *Am. Rev. Tuberc.*, 22: 603–612 (Dec.), 1930.

Cycles in Influenza and Pneumonia—During the last 10 years there has been a clear-cut 3-year cycle in the death rate from influenza among the industrial policy holders of the Metropolitan Life Insurance Company. In

each of the years 1920, 1923, 1926, 1929 and in no other year of this period, the weekly death rate at the peak of the seasonal curve rose above 100 per 100,000 per annum. The individual waves of the cycles bear a marked resemblance to each other and the general form of the three waves in the whole cycle is characteristic. Invariably a wave of maximum height with death rates over 100 per 100,000 per annum for the worst week is followed by a markedly smaller wave in the next year and in turn by a somewhat larger wave which culminates in the third year in the maximum wave of the cycle.

The pneumonia curve is similar to the influenza curve but lacks some of its perfect regularity. The pneumonia curve reached its maxima in the same years as the influenza curve—1920, 1923, 1926 and 1929. But although in the 1921–1923 and 1927–1929 cycles there was an invariably increasing seasonal maximum from the first year of the cycle to the last, the first maximum was a little higher than the second in the 1924–1926 cycle.

The crest of the curve both for influenza and for pneumonia comes usually at about the 9th or 10th week of the year while the ascending limb of the wave usually starts toward the close of the preceding year. The duration of the wave is about the same for the two diseases but the range of fluctuations in the death rate is much greater in influenza than it is in pneumonia. During the entire period of 10 years the annual maximum in the death rate from pneumonia ranged from 126 per 100,000 in the 10th week of 1921 to 678 in the 7th week of 1920. The annual maximum of the death rate from influenza varied from 20 per 100,000 in the 11th week of 1921 to 441 per 100,000 in the 7th week of 1920.

The influenza epidemic of 1918 was somewhat abnormal in several respects—

it came more than one year later than might be expected from the 3-year cycle and fell at an unusual time of the year. All the crests of the waves in the series 1920-1930 fell in the winter and early spring months usually February or March. The epidemic of 1918, however, began suddenly in September and ran high during the rest of the year, subsiding in April or May of 1919.—*Stat. Bull., Met. Life Ins. Co.*, 11: 1-4 (Nov.), 1930 and 11: 3-5 (Dec.), 1930.

Chronic Rheumatism in Massachusetts—A survey made in 1929 in the state of Massachusetts reports rheumatism the greatest single cause of chronic illness, with duration of incapacity from rheumatism much longer than from any other disease. In Massachusetts at any one time, there are approximately 145,000 individuals suffering with rheumatism; 89,000 with heart disease; 56,000 with arteriosclerosis; 31,000 with nephritis; and 10,000 with cancer. Nearly 85 per cent of the cases of rheumatism are in individuals over 40 years of age.

The survey shows that of the rheumatism patients 67.9 per cent were either treating themselves or receiving no treatment. In the well-to-do group, the percentage of self treatment or none at all was 50 per cent; in the poor group 75 per cent. When questioned as to the reason for not employing a physician 46.1 per cent said that the doctor could not help them and only 12.5 per cent gave economic reasons. Only a small per cent (0.6) received hospital care and 0.9 per cent nursing care. About 1 per cent felt they needed nurses but were unable to employ them due to economic reasons.

The median age of rheumatism patients was 62.6 years and the median age at the onset of the disease 51 years. The average duration of rheumatism up

to the present time was 11.6 years, complete physical disability being present in 4.2 per cent of the cases, and partial disability in 30.4 per cent. Among the poor, the complete disability rate was significantly higher, being 7.1 per cent. The average duration of disability during the past year among those confined to bed was 2.3 months, and among those confined to the chair 4.5 months. The average duration of partial disability was 6.1 months.

About 12 per cent of the patients with rheumatism were living in homes entirely unsuited for their care. About 12.2 per cent of the wage earning rheumatic patients were completely disabled economically, and about 12.2 per cent partially disabled. During the last year, 46.5 per cent of these wage earners lost an average of 4.6 months from work.

At Robert Breck Hospital, Dr. Francis Hall reported that of the total number of cases, 95 per cent were helped, 66 per cent with good results and 29 per cent with partial results. In this country better hospitalization for difficult cases, and good diagnostic clinics, furnishing advice, would facilitate the care of rheumatism.—*New Eng. J. Med.*, 203: 1232-1233 (Dec. 18), 1930.

Undulant Fever in 1929-1930—Undulant fever, in its various forms, tends to take an increasingly important place among infectious diseases prevailing in countries with a temperate climate. In Malta from 1926 to 1929 the disease has increased from 602 cases to 1,288, and during the first 8 months of 1930, 1,084 cases were recorded. In Italy the number of cases has remained practically constant, with 959 cases in 1928 and 956 in 1929; in the two years previous, the cases numbered 1,085 in 1926 and 1,071 in 1927. An epidemic of 32 cases in Florence was attributed to the consumption of cheese made from

the milk of sheep heavily infected with epizootic abortion, which had also prevailed among cattle.

In France where it appears that undulant fever formerly had its origin chiefly in goats, from Mediterranean areas, and where the majority of human cases now originate in sheep, the number of cases has increased from 124 in 1928 to 155 in 1929, and 164 in the first 9 months of 1930. The rural cases are attributed to contact with animals affected with epizootic abortion or with manure contaminated by them, and the urban cases are attributed to the consumption of raw milk and fresh cheese from these animals.

In Northern Africa, the infection is stationary, and in Turkey the disease exists but figures are missing. Yugoslavia showed only one case in 1929; Greece 35 during the first 9 months of 1930; Southern Rhodesia 13 in 1926; 2 in the first 8 months of 1930.

The number of cases of undulant fever is growing in Denmark from 372 in 1928 to 503 in 1929, and in Sweden, cases are numerous, with 118 in 1929.

Germany showed 57 cases in May, 1929, of which 25 were recorded in Schleswig-Holstein, 10 at Kiel, and 7 at Hamburg. Three cases in Poland, 1 in Czechoslovakia, 1 in Hungary, 14 (most of which were of bovine origin) in England and Wales, 1 in Scotland and 2 in Northern Ireland were reported.

Since 1925, the cases of undulant fever reported in the United States have increased rapidly from 24 cases in 1925 to 1,505 in 1929, with the greatest number in Ohio, Iowa, Missouri, New York State and Kansas. Every state of the Union had cases of the infection in man.

It is difficult to establish accurately the fatality of the disease because of pathogenic properties of the germ and because of a lack of sufficient characteristic symptoms to make diagnosis and statistical record possible. In the United States the fatality was about 3 per cent. The influence of occupation is obvious, veterinary surgeons paying a particularly heavy toll to undulant fever.—*League of Nations. Monthly Epidemiological Report*, 9: 409–417 (Oct. 15), 1930.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

EMERGENCY SANITARY MEASURES FOLLOWING A FLOOD DISASTER *

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IT is assumed that this title refers to the floods which occurred on the Rio Grande in New Mexico in August and September, 1929.

Before going into detail on the relief work, it might be well to describe the flood.

On August 13, word was received late in the evening that San Acacia, San Marcial and other towns in the Rio Grande Valley were flooded. The writer secured a supply of chloride of lime and left immediately for the flooded area. The small village of San Acacia had been covered with from 2 to 3 ft. of water. The residents had had only a few minutes warning and as a result they were able to save practically none of their belongings. The angry waters of the Rio Grande had backed up behind a highway bridge just above the village; when the bridge failed there was a rush of water which was sufficient to overtop the dikes and it was only a matter of a few minutes before the village was inundated.

The area affected was a strip of river valley varying from 2 to 5 miles in width and about 50 miles long. A large portion of this valley land was under

cultivation. All told, about 350 families were seriously affected by the flood. The devastation was tremendous. Adobe houses crumbled like lumps of sugar in hot coffee. Harvested crops were carried away by the swift current. Corn fields were flattened. New channels of the river selected choice farms for their new courses. Irrigation ditches and diversion works were demolished. Drain ditches were filled.

On September 23, another flood of greater proportions came down the Rio Grande. Areas left untouched by the first flood were completely wiped off the map. What was left in San Acacia was carried away and the main channel of the river cut through the side of the village. The entire area was covered with from 2 to 5 ft. of sand and silt. Railroad service was paralyzed as approximately 50 miles of track was damaged, about 5 miles completely gone and two bridges seriously damaged. Highway transportation was demoralized on account of bridges being washed out and grades being flooded or badly washed. In the first flood, San Marcial suffered only from surface runoff which was unable to get into the swollen river; however, in the second flood, the dikes gave away and the river came right through the town. River sand and silt was deposited to a depth of about 5 ft.

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

on the main street. In places one can walk on the sand and step up on the roofs of one-story houses.

In the second flood, from 12 to 48 hours warning was received that the high water was coming down the river, and all residents had ample time to move to higher ground. As a result no lives were lost and a large proportion of personal belongings was saved.

A passenger train carrying 70 passengers and crew was marooned between two washouts. Within one hour after the passengers were removed, the site was under 5 feet of water. The crew, however, stuck to their posts and it was 3 days before they were rescued.

Sanitary measures employed were as follows:

1. Protection of water supplies
2. Disposal of sewage
3. Typhoid immunization
4. Provision and inspection of food supplies
5. Assistance to the National Red Cross in rehabilitation
6. Hospitalization of the sick

In the flooded area, only one water system was affected. This was the Santa Fe Railroad supply at San Marcial. Approximately all of the residents obtained their drinking water from this supply. The source was a large dug well. Flood waters covered the ground surrounding the well but did not overtop the curb. Inspection of the masonry wall gave no evidence of flood water gaining entrance to the well at any point; however, as a precautionary measure, the well was dosed with 1 lb. of chloride of lime daily about one hour before the pump was started. Later bacterial examinations demonstrated that the untreated water was safe.

As in most rural communities, other sources of water were dug, driven and drilled wells. All dug wells in the area were inspected, cleaned where necessary, and dosed with chloride of lime. The amount of hypochlorite used varied with

the amount of water in the well, but at least 6 oz. were used. Driven wells were from 25 to 30 ft. deep and the ground water at this depth was not affected.

Even the worst disasters offer some amusing incident. This was no different. This particular well was not in the flooded area, but it had been filled with surface water following a severe rain. None of the family was at home, but one of the relatives was present when the writer came along. Explanation was made regarding the danger from the well water, and the well was "shot" with a liberal dose of lime. Instructions were left to the effect that if after a few hours the water tasted too bad, a large amount of the water in the well could be pumped out and gain the advantage of dilution with ground water. A few days later the writer was told that his method of sterilizing wells was no good, and that the best thing in the world to clean up a well was a quart of milk. The owner upon coming home found the water in his well rather tasty, so he proceeded to pump out the water and clean the well. He found an empty milk bottle in the bottom. The relative, hearing of the incident, recalled seeing me pour a white liquid into the well, and since there was a milk bottle in the well they concluded I must have poured in milk. The owner said the water in the well was "sweeter" than it had ever been before. Perhaps the cleaning was useful as well as the "milk."

In the refugee camps in the foot-hills, water from deep drilled wells was available. However, with several families living in each house, and many families living in tents supplied by the Red Cross, sanitary conditions were not the best. Toilet facilities were hastily provided where they were not already available, and all toilets were dosed daily with chloride of lime. The

amount of lime used daily may be questionable as to its sterilizing value, but it was certainly of value as a deodorant and fly repellent.

As soon after the first flood as vaccine could be procured, all members of the medical profession in the flooded area were pressed into service, and typhoid immunization was offered free of charge. Following the second flood, the vaccine was again offered. Approximately 1,800 persons received the initial dose of serum, and about 60 per cent of these received the three injections.

One case of typhoid was in San Marcial before the flood. It was necessary to place this case in the hospital. The father of this patient refused vaccination, and he later contracted the disease and died in the hospital. Four cases of typhoid fever developed in the flooded area, and they were all among un-vaccinated persons that had refused to be protected.

Hospitalization and funeral expenses were borne jointly by the Red Cross and the State Bureau of Public Health.

Following the second flood, all stores in San Marcial were in ruins. Some warning of the high water had been re-

ceived, and the storekeepers had been able to transfer some of their stocks to higher ground, but these were all consumed within 24 hours. The Red Cross brought in food supplies by truck and established a commissary where 1,000 people were supplied with food for several days. After transportation facilities had been repaired, and all families investigated by the State Bureau of Child Welfare, the Red Cross provided food only to those in need.

After the major preventive work had been completed, the writer was loaned to the Red Cross to assist in rehabilitation work.

In closing, it is desired to give a few words of praise where praise is due.

The Division officials of the Santa Fe Railroad, in spite of their troubles, were never too busy to give all assistance possible. The American Red Cross cannot be praised too highly for their prompt assistance in this matter. The State Highway Department, Bureaus of Child Welfare and Public Health voluntarily placed their representatives under the supervision of the Red Cross Director, and close coördination of all relief work was maintained at all times.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., PH. D., AND LEONARD GREENBURG,
M. D., PH. D.

Abnormal Mental States Among Industrial Workers—This highly mechanized age calls upon men to make tremendous adjustments and the machine does not recognize that a man has a soul, a self, an "I." Because of this, man will probably never be successful as a tool. Modern industry therefore tends to create neurotic problems.

Those who show abnormalities of self we have labeled "cranks," "trouble-makers," "nuts," "damn fools," etc. They are also of greatest concern to society. Not insane, they could be made of less concern to society if business or industry could assist more in their adjustment.

The "paranoid personality," or the one who is never quite ready to face fairly and squarely his own shortcomings, stands in about the same position in industry as the proverbial monkey wrench thrown into a machine. We psychiatrists believe that much can be done for such individuals. Occasionally a person with true paranoia gets into a responsible position in industry and he sometimes convinces others that his object of accusations is insane rather than himself. He is often a great potential danger.

A serious injury leaves one of two types—he who immediately sets about to adjust himself to the new conditions which must prevail, and he who refuses to be consoled and to attempt a reorganization of his economic life. In regard to the feeble-minded, and the epileptic, the former is usually rather easily adjusted as he is perfectly willing to furnish the eyes, ears, hands, and feet

for some machine. As to the latter, a job analysis should be made to see where he may fit in.

Industry, in trying to direct each worker into the thing he can do best, must recognize that society is made up of individuals of all stages of mental and physical health, and that grievances are pretty largely matters for psychiatric analysis as well as for the recognition of factual relationships.—Emerson North, M.D. Abstr. of paper presented before the Industrial Hygiene Section of the A. P. H. A., Fort Worth, Tex., October 27, 1930. E. R. H.

Findings After 7 Years' Experience of Compulsory Examination of the Eyes of Employees—At the request of the Eyesight Conservation Council, the Eastman Kodak Company, through its Medical Department, made a special survey to determine the findings of ocular conditions after 7 years' experience, where each year about 5,000 applicants, averaging 21 years of age, were examined.

It was found that about 13 per cent of the applicants needed glasses; 40 per cent of those already wearing glasses needed to be refitted; and a small percentage had diseased conditions needing medical attention of which conditions they were quite unaware. A number of the applicants had never suffered from headache, eye strain, or other symptoms, which indicates that a check-up now and then is a beneficial procedure.

The company in 1914 inaugurated complete physical examinations of all applicants for positions, a procedure

which is still required. Ocular examinations are necessarily more precise for working in some departments than in others. In the recent study, the applicants considered were almost evenly divided as to sex, there being 276 men and 224 women. As to age, 462 were under 40 years of age and 38 were over 40. Of the 462 under 40, only 78, or 17 per cent, had poor vision; of the 38 over 40, 13, or 34 per cent, had poor vision. This indicates that age is a decisive factor. In 1922, out of 3,280 employees, 1,231, or 37.5 per cent, were found to have defective vision (including those wearing glasses as well as those not wearing glasses). These were employees of Kodak Office, Camera Works, and Hawk Eye Works. The average age of the group was considerably higher than that of applicants for employment.

In a group of 435 older employees, 310, or 71.3 per cent, were found to have defective vision.

A record of symptoms among these employees showed that in spite of the fact that 124 of 259 persons who had never worn glasses made no complaints of headaches or eyestrain, the other 135 complained of such symptoms, and 93 needed glasses. Reexaminations are more likely to result in a prescription for glasses than an initial examination. Occasionally some actual pathology is discovered through these ocular examinations.

To date, no extended study has been made of results of improved vision on production and efficiency. Individual cases have come to attention where improvement has been marked, while relief from headache and eyestrain has a beneficial effect on general condition and efficiency.

Less extended statistics (regarding eye examinations) are also given for Montgomery Ward & Co., Oakland, Calif., The Chicago Northwestern Railroad, and others by the U. S. Public

Health Service, as well as The Metropolitan Life Insurance Co., and the Life Extension Institute.—Mimeograph report J. Walter Thompson Company, 420 Lexington Ave., New York, N. Y., Nov., 1930.
E. R. H.

Clinics and Clinics Procedure—

The first prophylactic clinic of the Consolidation Coal Company, Inc., was conducted in 1927. The advance work met with many objections and a few threats. After 400 home visits presenting the plan and objectives, at which time consent slips were left with parents to have their children protected against certain diseases and stating that they were privileged to go to any physician whom they might prefer at their own expense but that the company would pay for its employees, 186 children were immunized that year against diphtheria. In 1929, 572 children were so immunized with less than 100 home visits.

In February, 1928, when 2 cases of smallpox appeared in Harrison County, W. Va., a prophylactic clinic was in operation within 48 hours and with the help of the local press 3,024 persons were vaccinated, the County Health Department furnishing the vaccine.

In August, 1928, advantage was taken of the appearance of a typhoid case in one of the camps to proclaim immunization which was only fairly successful for the first treatment, but before the second treatment was due, 2 more cases developed, and this brought the attendance at the clinic to 100 per cent of all persons in the camp. No further developments and no deaths occurred.

In 1930, the second typhoid immunization campaign was put on when 1,765 completed vaccination for typhoid. Hence, the workers were realizing and appreciating the efforts to protect them.

In our experience in coal mining camps, advance work consists of home visits, talks in the schools and churches, and at games and social functions.

Proper publicity, necessary equipment, etc., are arranged through the mine office and company store.

In regard to prenatal clinics, it was found that they were not successful when the patients were asked to come to the office, but became successful when arrangements were made to conduct the work in the homes and a day set aside for this purpose each month has proved satisfactory. The doctors and the nurse make the rounds and each case receives routine or special care and instruction as indicated.

Preschool clinics in these camps have not proved a success thus far, so far as corrective work goes. Among other reasons is that the parents fail to see why children should be examined before starting to school when they are required to be examined soon after entering and add: "We never have the money to have them fixed up." (An accompanying table shows the number of clinics and the attendance in the company's camps for the years 1929 and 1930.) The type of clinics comprises prenatal, nose and throat, tuberculosis, venereal diseases, well baby, preschool, immunization, and others.—M. G. Frazer, R.N., *Special Report*, Consolidation Coal Company, Inc., Medical Department, Fairmont, W. Va. E. R. H.

Junior Wage Earners—In Ohio the Bing Law requires all children to remain in school until they are 16 years of age. Working permits may then be issued as follows: regular permits to boys and girls, 16 or 17 years of age who have completed at least the 7th grade of school and who can pass the physical examination; retarded permits to those of the same age who have been unable to complete the required 7th grade because of mental retardation; part-time permits to children 14 years of age and over who are still in school, and who desire to work before and after school hours or during vacation; con-

ditional permits to those of 16 or 17 years of age who have mental ability to complete the 7th grade, but who, through lack of educational opportunity, have failed to do so before they became 16 years old.

The Cleveland school system has just completed a notable study of 13,875 such permits granted for the year ending July 1, 1929, and represented by 10,790 first permits and 3,085 renewals. There were 8,263 boys and 5,612 girls given permits of one type or the other.

With the boys, it was found that 19.9 per cent went into the metal trades, 10.1 into the telegraph industry, and 6.2 into the electrical manufacturing and the retail food industry respectively, the balance into widely scattered industries. With the girls, it was found that 23.8 went into housework, 19.1 in department stores, 13.4 into clothing manufacturing, 6.0 into electrical manufacturing, and the balance were widely scattered.

Each time a boy or girl between the ages of 14 to 16 changes from one job to another a new work permit must be issued. Permits so issued during the school year average 1.3 per child, the rate being the same for boys and girls. Nearly 80 per cent of the regular work permits issued were granted to 16-year old boys and girls. Those of foreign parentage obtained almost half of all work permits issued.

Only 1 in 16 permits was issued to a retarded child, boys averaging a little higher than girls. Boys of German and Austrian parents averaged only half as many of this type of permits as the entire group of boys under consideration. Negro boys received 5.7 times the number of retarded permits for all groups, while the Negro girls received 8.5 times the girls' average. Italians ranked next with 1.7 times the average for boys and 2.7 times the average for girls.

The older boys work in metal factories in larger proportion than the

younger boys, who usually work for a telegraph company, a retail food concern, a department store, etc. More than one-half of the boys in the latter trades quit within 1 month, while the department stores and electrical manufacturers retain their boys for 6 months or longer.

Girls who are 14 or 15 years old work in the department stores' group in largest numbers. The second largest group do housework and the third largest group work in retail food establishments. Many of the girls employed by department stores quit in less than 1 month, although almost 50 per cent work more than 3 months. Almost three-fourths of all work permits issued to Negro girls were for housework. In view of this fact it is unfortunate that so many of these girls elect commercial and industrial courses during their school year. The percentage of white girls doing housework decreases with each grade of school completed, while the percentage of those who enter the employ of department stores increases with each grade of school completed.—C. W. Hall, *Educational Research Bull.*, Ohio State University, 18, 18: 2508-2511 (Dec.), 1930. E. R. H.

International Conference on Silicosis, Johannesburg, South Africa—The Conference was opened by H. W. Sampson, on August 13, 1930, who directed attention to the importance of the problem of silicosis, the compensation of nearly 1,000,000 pounds per year expended upon it in the Rand, and the value of an international effort to study methods of coping with it.

Dr. L. G. Irvine, Director of the Miners' Phthisis Bureau, having been elected as Chairman, the Conference proceeded to discuss the three questions submitted for its consideration: (1)

The medical aspects of silicosis; pathology and clinical phenomena of the disease; (2) preventive measures; and (3) compensation.

The Conference closed on August 27, and was able to reach agreement on a number of recommendations which will be published shortly.—*Industrial and Labour Information*, League of Nations, XXXV, 12: 364 (Sept. 22), 1930.

In connection with the above Dr. A. G. Cunningham of the Canadian Bureau of Industrial Hygiene who attended the Congress reports a summary in the January, 1931, issue (22, 1: 44-46) of the *Canadian Public Health Journal*. He dwells especially upon diagnosis in which the Conference recommended for general acceptance the classification of cases of silicosis developed and used in South Africa, viz., "First Stage," "Second Stage," and "Third Stage." The so-called "ante-primary" is the "first" compensable stage. The chief characteristics are given for each stage. Under prognosis the ante-primary case has a life expectancy of 13 years, while practically all cases ultimately progress, usually with the development of tuberculosis, to total disability. Compensation matters are also touched upon. E. R. H.

Compensation for Silicosis in Sweden—The Swedish Riksdag has adopted an amendment to its occupational disease act providing for compensation for silicosis. It is now accepted as having been fully investigated and is a typical occupational disease. The act will also cover other diseases of the lungs caused by stone dust, in addition to silicosis, and will come into force on January 1, 1931.—*Indust. & Labour Inf.*, League of Nations, XXXV, 12: 311-312 (Sept. 22), 1930.

E. R. H.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Some Observations on the Behavior of Vitamin A in or from Primary Sources—This study was undertaken on food rich in vitamin A to determine the effect of storage on rancid fat soluble in vegetable oil and the effect of ultra-violet light. Dried ground spinach was stored in mason jars in diffused light and the potency tested on experimental animals.

At the beginning of the experiment, 20 mg. of the material was sufficient for weight gains. At the end of 6 months, 30 mg., and after 15 months, 100 mg. showed definite loss of vitamin A potency in storage during the period. The destruction of the vitamin during this period is estimated in the neighborhood of 70 per cent. Experiment work has shown the destruction of vitamin A by products found in rancid fats. Rancid butterfat was added to dried, powdered spinach and the finished sample contained 20 per cent of added fat. Parallel tests on those recorded for the storage experiment were made, making allowance for butterfat. Animals fed 30 mg. portions of the rancid fat alone made no growth.

At the beginning of the period, 34 mg. daily portions were sufficient, after 6 months, 0.036 mg., after 12 months, 0.063, and after 15 months 0.125 mg. The animals made practically the same gain the first 8 weeks on the fat-spinach mixture as was observed on the spinach supplement alone, indicating no rapid or marked destruction of the vitamin A in the rancid fat at this time.

To determine the solubility of vitamin A of plant tissue in oil, 3 products were used—tomatoes, carrots and broccoli. These were dried in an air oven

and triturated with peanut oil. The mass was filtered and the clear oil fed. Gains of experimental animals on the oil supplements indicated that the vitamin A of these 3 types of plant tissue is readily soluble in peanut oil.

In determining the effect of ultra-violet light, petroleum extracts of carrots were irradiated in quartz flasks at a distance of 12 inches from a mercury quartz lamp for from 3 to 5 hours. The extracts evaporated upon cornstarch were fed to rats in comparison with similar amounts of non-irradiated extracts. Rats on the non-irradiated extracts made good growth throughout the entire experimental period of 56 days. Those on irradiated supplements made no more gains than those on the vitamin A-free diet.—E. J. Quinn, J. G. Hartley, M. A. Derow, *J. Biol. Chem.*, 89: 657 (Dec.), 1930.

Evidence for the Presence of a Third Factor in the Vitamin B Complex of Yeast—Recent literature recognizes two very definite factors in vitamin B complex, but the reports on the third or vitamin B₃ are contradictory. This is described as thermolabile by 4 out of 5 recent investigators. The fifth reports this as thermostable. This principle is recognized as necessary for the normal growth of pigeons but as to rats evidence is contradictory.

In the present experiment, white rats were fed a basal diet deficient in all factors of vitamin B contained in yeast, supplemented by adding whole yeast and various fractions for different groups. The preparations employed were: an extract containing the thermolabile, antineuritic factor B₁, an extract

containing the thermostable factor B_2 , and the residue after extraction of these factors which is termed Fraction R.

Fractions B_1 and R were dried in air and B_2 concentrated with water so that each c.c. represented 4 gm. of the original yeast. The basal diet contained all of the vitamins except B complex. The controls on the basal diet showed definite symptoms of avitaminosis. Those on the whole yeast with other preparations were in excellent general condition and showed normal growth. The rats on the antineuritic Fraction B_1 supplement failed to grow but no polyneuritis developed. Those on the B_2 factor gained at first but later lost and in two cases developed polyneuritic symptoms. None of the animals showed the red, bleeding lesions of the eyelid as displayed in the group deficient in B_2 . Fraction R failed to promote growth. All of the rats developed eyelid lesions but no true polyneuritis.

The growth curves of the rats on the whole yeast extracts are better than any single group but not entirely normal. The fact that extraction of yeast is not equal to whole yeast may be explained by either the failure of the extraction to remove the water-soluble vitamin or that there is a water-insoluble growth factor. The authors favor the latter. The fact that this is not vitamin A nor D is demonstrated by the fact that the basal diet contains adequate amounts of butterfat and cod liver oil, while there is an optimum amount of salt mixture. Since the Fraction R is thermostable, it is regarded as similar to the factor described by Hunt. (*J. Biol. Chem.*, 79: 723, 1928), but differs from all other similar factors described.—Geo. Z. Williams and Robert C. Lewis, *J. Biol. Chem.*, 89: 275 (Nov.), 1930.

The Toxic Effects of Fish Liver Oils and the Action of Vitamin B—
Numerous instances are cited in the

literature on the toxic effects of fish liver oil, and in some instances constituted less than 2 per cent of the diet. In testing oils for vitamin A, symptoms closely resembling vitamin B deficiency were observed in experimental animals on large doses of cod liver oil and a basal diet of 10 per cent of yeast. Since there was a variation in the toxic effects of different oils, systematic experiments were undertaken to determine if this were due to variations in vitamin A and D. Two basal diets—one with 10 per cent yeast and the other with 18 per cent—were used.

The oil was fed in amounts up to 0.2 gm. per day. Two oils were used, one 5 times as potent in vitamin A as the other. With 0.207 gm. daily dose of oil, the animals after 3 to 4 weeks were apparently normal after which they exhibited vitamin D deficiency.

On an 18 per cent yeast ration vitamin A deficiency was observed at low levels, but normal rate of growth when fed 0.207 gm. The more potent sample showed normal growth for all levels of oils on both 10 per cent and 18 per cent yeast.

Cod liver oils of varying potency were compared with ratfish-liver oil less potent in vitamin A than the others. The ratfish-liver oil was taken with a 10 per cent yeast diet, although on 18 per cent yeast, normal growth was obtained.

To determine the relationship of vitamin D, rats were fed 0.05 gm. cod liver oil which would give good growth on the highest level on a 10 per cent yeast diet, and with added excess vitamin D as activated ergosterol. The animals showed normal growth on both 10 and 18 per cent yeast.

The vitamin D was only 1 to 4 times the amount received with the cod liver oil, compared to 10 to 100 times the dose showing deleterious effects. In addition to the neutral glycerides of cod liver oil, phospholipids and sterols, the

product contains various amines, isomylamine constituting one-third of the bases present.

It was found that small doses of isomylamine in amounts found in cod liver oil result in paralysis, convulsions and lack of growth and that this toxicity may be offset or prevented by adding yeast. The authors point to the fact that the quantitative determination of vitamin A in cod liver oil is influenced by the amount of yeast in the basal diet and that determinations of vitamin B are not comparable where cod liver oil is used to furnish A and D factors.—Earl R. Norris and Anna E. Church, *J. Biol. Chem.*, 89: 437 (Nov.), 1930.

A Study of the Japanese Persimmon Grown in Florida. I—Chemical Analysis—The production of the Japanese persimmon in Florida has been greatly stimulated since this fruit matures in late summer and early fall when there is little other fruit in that section of the country. A study was made to secure data on the chemical composition of the different varieties and on the vitamin content of one variety—the Tane Nashi. A description, as well as a table showing the composition, is given of each variety of the Japanese persimmon. Analyses for carbohydrate, moisture, ash, fiber, and protein were made on individual fruits. In its high carbohydrate content, the persimmon seems to be in the same group with fresh figs, fresh prunes, and bananas. Another characteristic is its low fiber content, it being so small in some varieties that it cannot be estimated with accuracy.—Jennie Tilt and Rebecca B. Hubbell.

II. The Vitamin B Complex—In the study for vitamin B the method of Sherman and Spohn was used to determine the amount of persimmon which must be added to a B-free diet in order to maintain animals over a period of 8

weeks. Albino rats, 28 days old, weighing 40 to 50 gm. were used. A basal diet of B-free casein 18 per cent, cornstarch 68 per cent, butterfat 8 per cent, Osborne & Mendel salt mixture 4 per cent, and cod liver oil 2 per cent was used.

The persimmon was fed at the following levels, 1.0, 1.5, 2.0, 2.5, 4.0, and 5.0 gm. daily. Tables give the average weight curves as a result of the experiments. There is very little variation in the average weight curves for the different levels indicating that the persimmon does not have sufficient vitamin B for maintenance, when the rest of the diet is adequate except for this factor. In all cases there was practically no increase in weight but a steady decline, and none of the animals lived through the entire experimental period of 8 weeks.—Jennie Tilt, Rebecca B. Hubbell and Lois Inman, *J. Home Econ.*, 22: 757 (Sept.), 1930.

The Nature of Dietary Deficiencies of Milk—It has been pointed out that milk is too poor in iron to meet the needs of the growing young and that the young are born with a store of iron to last through the suckling period. Numerous experiments have shown that when young growing rats are put on a milk diet alone, growth is arrested and anemia develops. Hart & Steenbock have shown that the addition of copper and iron to such a diet results in prompt relief of anemia (see abstract this *Journal*, 18: 1059, August, 1928).

The experiments reported in this paper show the reproductive behavior of rats on rations consisting chiefly of dried milk. Tables are given showing the percentage composition of the diets used and a summary of the reproductive histories of the animals. Of 38 diets in which milk powder was used, at 60–85 per cent level in combination with other substances, only 24 lived for production

of young. In only 4 cases were there 5th generations. The supplements used in these diets were cooked, dried beef liver, 4 and 5 per cent, yeast 5 per cent, and a combination of ferric citrate and copper sulphate.

Rats on milk supplemented with ferric citrate and copper showed normal growth and fertility for 6 generations. The authors point out that there is probably a quantitative relation of liver and milk more favorable to growth than that employed in their diets.—J. Ernestine Becker and E. V. McCollum, *Am. J. Hyg.*, 12: 503 (Sept.), 1930.

Viability of Lactobacillus Acidophilus and Lactobacillus Bulgaricus Cultures Stored at Various Temperatures—The writer conducted a number of experiments to ascertain the viability of *L. acidophilus* and *L. bulgaricus* strains when stored at different temperatures. One strain of *L. bulgaricus*, two stock strains, and one freshly isolated strain of *L. acidophilus* were used in the form of cultured milk for the purpose of these experiments. One commercial broth culture of *L. acidophilus*, as well as laboratory stock cultures of Lactobacilli were also included in similar studies.

The author states that milk cultures of *L. acidophilus* may be stored at refrigerator temperatures for several days without causing any marked reduction in the number of viable organisms.

Less reduction in numbers of *L. acidophilus* occurred at refrigerator temperature, 9° C. (48° F.) or even at 0° C. (32° F.), than occurred at 37° C. (99° F.).

Apparently there was little difference in viability between organisms in acidophilus milk kept several days at refrigerator temperature 9° C. (48° F.) and at 22° C. (72° F.).

From these results, the author is of the opinion that cultured milk could be held at the usual storage temperatures of 4.4° C. (40° F.) or below, for several days without greatly affecting the number of viable acidophilus organisms and controlling the palatability on the basis of decreased acid production. The various strains of *L. acidophilus* examined, all reacted similarly to the different storage temperatures. The strain of *L. bulgaricus* used also reacted in a similar manner. Results of one acidophilus commercial broth culture indicated that refrigerator storage was also preferable to storage at room temperatures for that product.

Laboratory stock cultures of *L. acidophilus*, whether old or recently isolated strains, remain viable when held in the refrigerator and transferred once in 4 to 6 weeks, or longer. In one instance, a sealed tube of a freshly isolated fecal strain stored at refrigerator temperatures for 1 year was viable when removed.—Luther A. Black, *J. Dairy Sci.*, 14: 59 (Jan.), 1931.

CHILD HYGIENE

RICHARD A. BOLT, M. D., DR. P. H.

NEONATAL MORTALITY

IN these columns last month it was suggested that inherent weakness of the developing embryo and fetus may account for no small part of the high fetal and neonatal mortality. Those of us vitally interested in child hygiene should keep abreast, therefore, of recent contributions to eugenics and racial hygiene. It is becoming increasingly evident that there is an enormous loss of life *in utero* and that this is intimately related to the morbidity and mortality of mothers and prospective mothers. Some years ago Ballantyne estimated that out of every 1,200 conceptions there eventuated 1,000 live births. At present it seems that Karl Pearson's estimate of 1,500 conceptions to every 1,000 live births is nearer the real situation. Testimony from leading obstetricians and gynecologists indicate that there has been an undoubted increase in abortions since the World War, especially induced abortions. These have contributed materially in keeping maternal mortality unduly high in this country.

Detailed studies of maternal mortality, conducted in a number of the states in coöperation with the U. S. Children's Bureau, have revealed abortion as a potent cause of maternal death. For example, in a study of the maternal mortality in Kentucky for the year 1927¹ it was found that 45 per cent of all puerperal deaths were due to septicemia, and of these more than two-fifths followed abortions, at least half of which had been induced. In a similar study of 1,627 deaths of women in Michigan from causes connected with child-birth² it was discovered that there were 465

deaths of which abortion was either the direct or indirect cause. This represented 28 per cent of the puerperal deaths for the 2½ years under consideration. In other localities from 25 to 35 per cent of the maternal deaths have been found to be connected with abortions, a large percentage of which were induced. While this condition involves more than the attention of the health authorities, a large share of responsibility must be placed upon their shoulders for a broader education as to the dangers of abortion, and more ample provisions for prenatal instruction and community obstetric service.

Clearly, most of these early deaths are not a part of a process of natural selection, but are due to the ignorance, carelessness, or thoughtlessness of the parents, especially the mother, or to the lack of judicious and skilled medical and nursing care at the time of confinement. It has been difficult to draw any exact conclusions in the past, due largely to the incompleteness or inaccuracy of statistics of fetal and neonatal deaths. The clinical aspects of the cases have not been sufficiently stressed in the birth and death certificates. Up to a few years ago complete autopsy findings of fetal and neonatal deaths were not available in any large number, and hence it was difficult, if not impossible, to assign to deaths their real causes. Considerable light has been thrown upon the causes of neonatal deaths by the Child Life Investigations of the Medical Research Council of Great Britain.³

The report of Dr. Cruickshank is very enlightening. He sets forth a de-

tailed description of the autopsy and serological findings of 800 neonatal deaths which were examined by him at the Glasgow Royal Maternity and Woman's Hospital. His findings merit close attention:

1. Of the 800 neonatal deaths (within 28 days of birth) 540, or 67.5 per cent, were classified as being due to asphyxia neonatorum, congenital atelectasis, prematurity or birth injury, that is, associated with delivery. Four hundred of these infants were premature and 140 full term.

2. In 238 cases, or 29.75 per cent, death was due to some infection acquired either before, during, or after delivery.

3. Death in 22 cases, or 2.75 per cent, was due to some developmental defect.

4. Seventy and six-tenth per cent of the total deaths occurred during the first week of life; 19.4 per cent during the second week; 7.3 per cent during the third week; and 2.7 per cent during the fourth week.

5. The presence of congenital syphilis was definitely established in less than 1 per cent of the whole number of cases. This is a smaller percentage than found in other series but can be accounted for by the fact that this series is dealing only with neonatal deaths and not with stillbirths among which syphilis is a cause of a much higher percentage, ranging from 10 to 15 per cent.

Dr. Cruickshank points out, further, that a large proportion of the neonatal deaths have causes which must be sought in the causes of stillbirths rather than in post-natal conditions. He offers the following suggestions to improve conditions:

The suggestions are made in a tentative way and with a full appreciation of the administrative and financial difficulties which their adoption would involve.

1. Increased efforts should be made to deal with preventable accidents and injuries incidental to delivery. This means that the antenatal supervision of the pregnant women must be encouraged and must be continued up to the time of delivery. . . . The public requires still further education as to the need for supervision—not merely for the detection of the toxemias of pregnancy, urinary infections and other medical complications of pregnancy, but in order that threatened obstetrical complications may be foreseen and treated in the most appropriate way.

2. It is not sufficient to urge upon the public the necessity for antenatal supervision during pregnancy. If such advice is to be followed then there must be increased facilities for antenatal examination and treatment, both at clinics and in hospitals. Further, there should be a much greater number of beds available for the indoor treatment of obstetrical cases.

3. No scheme for dealing with neonatal mortality would be complete which did not include some measure for the improvement of the education of medical students, graduates, and midwives.

The whole report would bear careful reading. The extensive list of references at the end permits one to follow the other investigations which have been made along the same line.

It is well recognized that the successful outcome of prenatal care depends largely upon early examination and observation by the physician, and regular systematic follow-up with careful instructions on the part of a trained public health nurse. The medical technics and nursing routines already have been thoroughly worked out and tested by experience in the field and hospital, and where these have been applied from early pregnancy until the successful termination of that event, a satisfactory outcome for both mother and child is reasonably expected. The greatest difficulty appears to be encountered in influencing prospective mothers to place themselves under competent medical and nursing supervision as early in pregnancy as possible. Why does this condition still exist and make it so difficult to carry out satisfactory prenatal care? The following seem to conspire to bring this about:

1. Lack of knowledge on the part of the parents, especially the pregnant mother, as to the supreme importance of systematic prenatal care begun early in pregnancy

2. Indifference on the part of the pregnant mother and the feeling that pregnancy is wholly a normal process and does not need attention until late in pregnancy

3. The feeling that the cost of obstetric service will be raised by prenatal care

4. The lack of adequate prenatal care to follow up the cases

5. Lack of encouragement on the part of the physician

None of these obstacles are insuperable and where good community co-operation between the health authorities and the nursing and medical professions has been brought about practically all of them have been overcome. There is no question in the minds of those who have had an opportunity to study the effects of an adequate prenatal care and obstetric service that maternal and early infant mortality can be greatly reduced.

Various methods have been tried to secure and hold the interest of prospective mothers in prenatal care and supervision. The logical place to begin such education is in the secondary schools as part of courses in child care and pre-parental education. The Mothercraft Movement and Little Mothers' Leagues created a great deal of interest 8 or 10 years ago and various modifications of these have existed in some of our schools. There needs to be a revival of such movements along modern educational lines. That this matter is still receiving serious attention on the part of some of our educators is seen from recent articles in the *Journal of Home Economics*.⁴

Miss Parsons sketches a practical course which has been developed in the Fordson High School at Dearborn, Mich. The following outline indicates the scope of the course and the subjects covered.

I. The girl herself

A. Attractiveness and personality

1. Environment

a. Home

b. Members of the family

2. Heredity

B. What a family is and does

1. Responsibilities of the family to the girl

2. Responsibilities of the girl to the family

3. Responsibilities to herself

a. Health: physical; mental; social friends, choosing a mate

b. Knowledge of life

c. Human development; adolescence

II. Child development

A. Pregnancy

1. Care (diet, elimination, rest, etc.)

2. Preparation of baby's clothing

B. Confinement

C. Infant care (physical, mental, social health; bathing, feeding, sleep, exercise, sunbaths)

D. Child care (physical, mental, social, emotional, and esthetic development as influenced by such matters as food, clothing, sleep, elimination, simple diseases, play, playmates, learning to talk and to walk, discipline, fear, anger, holding grudges, love, appreciation of nature, music, art, and literature)

This course is made very practical by demonstrations of bathing, feeding, etc., and the class is divided into groups which make a study of children at different ages and report their findings to the whole class. Round table discussion is promoted. The group reports are then brought together in a class notebook with newspaper and magazine articles collected by the girls. The community aspects are demonstrated by a visit to the Merrill-Palmer School.

If such courses were conducted by well qualified public health nurses on the staffs of our secondary schools and credit allowed for the courses, a sound basis for maternal and child hygiene might be laid.

REFERENCES

1. Rothert, Frances. Maternal Mortality in Kentucky in 1927, *Kentucky Med. J.*, June, 1930.
2. Smith, Lillian R. Maternal Mortality, *Michigan Pub. Health*, July, 1930, pp. 148-159.
3. *Special Report Series No. 109*—A Clinical and Pathological Study of 1,673 Cases of Dead-Births and Neo-natal deaths, compiled by E. L. Holland and Janet E. Lane-Clayton, 1926; *No. 118*—The Cause of Foetal Death in 144 Cases, by A. C. Palmer, 1928; and *No. 115*—The Causes of Neo-natal Death, by J. N. Cruickshank, 1930.
4. High School Courses in Child Care and Pre-Parental Education (A Symposium)—Goodspeed, Helen C. Aims and Methods in the Teaching of Child Development. Parsons, Everice. A Teachable High School Course in Child Care, and Kennedy, Ada, Educating for Parenthood, *J. Home Econ.*, 23, 2: 132-137 (Feb.), 1931.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

Standards for Public Health Nurses in a City Board of Health—
The Detroit Board of Health has officially passed the following resolution defining educational standards for its nursing staff:

The public health nurse must have a fundamental education so that she can undertake successfully instruction of the general public in matters of public health as follows: prevention of illness; measures to be carried out to secure the alleviation of sickness; social service matters which involve proper hygiene in the home—this may involve such budgetary management of income that the nutritional requirements of the family may be adequate; child hygiene; applied psychology; a knowledge of welfare agencies which are available, together with the aid they can render; a sound theory and practice of rest, exercise, food raiment, cleanliness, and how inciting agents of disease are spread; laws, regulations, and procedures for preserving the public health.

All these activities impel the Board of Health to require a degree of intelligence and training for its public health nurses which is commensurate with the responsibilities involved. Therefore, be it

Resolved that, The standard of requirement for admission to the Nursing Division shall be: A college training or its equivalent. Until this standard can be attained, applicants must have at least graduated from an approved high school; graduated from a nurse's training school of an accredited general hospital, which has a daily average of not fewer than fifty patients. The training school of course must extend at least for a period of two and one-half years. Training for shorter periods will not be considered; some nursing experience; a nurse will not be given a permanent position until she has satisfactorily demonstrated her ability during a probationary period; excellent health, as indicated by physical examination made

by the department's Nurses Clinic; U. S. citizenship; registration to practise nursing in the State of Michigan; minimum age 23, maximum age 35, unless already trained in public health nursing, and possessing a record of accomplishment; postgraduate work in public health nursing, and an experience with a well organized agency which provides adequate supervision is desirable; credentials as to character, approved by the Department of Health.—

Congratulations, Detroit!—*Pub. Health Nurse*, XXIII, 1: 18 (Jan.), 1931.

Miss Hudson Leaves for the Orient—Nurses, and especially public health nurses, of this country and of many other countries over the world who have studied under Lillian A. Hudson, Associate Professor of Nursing Education, Teachers' College, Columbia University, New York, will be interested to know that she sailed from New York, January 10, on the R. M. S. Franconia to spend a sabbatical leave taking a world cruise. She touches Gibraltar, Monaco, Naples, Cairo, Bombay, Colombo, Madras, Penang, Singapore, Batavia, Bangkok, Saigon, Zamboanga—arriving in Manila March 26 where she will stay until April visiting friends and observing the public health nursing work. She then goes to Hongkong, Shanghai and Tientsin, and on to Peking, where she will be the guest of Anna McCabe and also visit Gertrude Hodgman at the Union Medical College. In July she goes to Japan where she will be the guest of Christine Nuno at St. Lukes Hospital, Tokyo. She will return in time for the opening of Teachers' College in September.—*Abstr. from a letter from M. S.*

* Please send printed matter or other material relating to public health nursing to Eva F. McDougall, 6 State House Annex, Indianapolis, Ind.

Whither Hourly Nursing?—Most people understand pretty well now that visiting nurses give skilled nursing care to the sick in their homes on a visit basis under the direction of the family physician, and that they expect those who can to pay the fee which ranges from \$.75 to \$1.15, depending upon what the actual cost per visit is; if the patient or his family cannot pay the full cost of the visit, they pay what they can, or nothing at all, in some cases.

Now hourly nursing is spreading and people do not understand it as well as the visiting nursing. Hourly nursing is designed primarily for persons requiring skilled nursing care but who do not need the full time of a private nurse. It is administered on the appointment system and charged for by the hour. Fees range from \$1.00 to \$3.00 for the first hour and from \$.50 to \$1.00 for each additional hour—usually the limit of time is 3 hours. This charge pays the cost per visit and there is no charity consideration attached to it.

Dr. C.-E. A. Winslow of Yale said back in 1927, "I hope to see nursing service in the homes of rich and poor—whether on a visitor, on an hourly, or on a daily basis—developed into one co-ordinated scheme of effective community service."

With 3 years of development since Dr. Winslow expressed himself thus, Beatrice Short in *American Journal of Nursing* says, "Just at present hourly nursing is in a stage of rapid development. Until recently, we might say

hourly nursing had been an extension of visiting nursing made available at a definite time at a higher charge per visit. Now, however, all kinds of experiments are under way.

Hourly service is being offered in different places by several methods: by individual nurses; by registries giving calls in turn to nurses devoting their time exclusively to this type of work, or to nurses on call for private duty; by public health nursing associations; or it may be offered under hospital administration; or under a joint committee representing the registry or nurses association, the medical profession, and a public health nursing agency. All plans are meeting with success.

The *Journal of the American Medical Association* says that the nurses' registry of the Chicago Medical Society has established an hourly nursing service.

In this country there is really a serious lack of skilled nursing care for the sick in their homes, while at the same time there is a serious unemployment problem among nurses. Many nursing leaders feel that hourly nursing offers a way of solution, but as Miss Short says:

Fluctuation in the demand for hourly service, difficulties encountered in serving a widely scattered territory, in taking care of sickness and vacation relief, in evolving policies acceptable alike to medical and hourly professions, as well as the communities, must be taken care of. Only a stable organization, with high ideals of service and professional leadership to put these ideals into practice can meet the demand of hourly nursing.

REFERENCES

- Pub. Health Nurse*, XX: 11, 1928.
J. A. M. A., XCV: 1921, 1930.
Am. J. Nurs., XXXI: 61, 62, 1931.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

The Spinach-Eating Motive—We must not merely arouse interest and spread information. *We must get action* or our efforts are useless. In *Hygeia* (Jan., 1931), J. Mace Andress, in "Appealing to the Right Motives," says:

The great problem of health education as well as any kind of education is to find the springs of behavior. . . .

The efficient teacher today realizes that you can get children to do almost anything—eat spinach, drink milk, take exercise, bathe frequently and think straight—if they can be made conscious of certain needs and ways in which these needs may be satisfied. This is another way of saying that the well trained teacher knows how to appeal to children through the right kind of motives. These motives vary with different ages and with different persons. In the lower grades a child may come to school with clean hands because he wants to get a star in the morning inspection.

When pupils reach high school such motives lose their power and others must be chosen that will be more effective. For example, some teachers in commercial departments have been able to get results in cleanliness by telling students that business men are less likely to hire anybody who is not clean and neat in his personal appearance, and that they hesitate to recommend pupils who are careless in personal hygiene. Cleanliness thereby becomes desirable when it is realized that it is a stepping stone to a position. It is not always easy to find a motive that will work, but the teacher is surprised at the lazy pupil who sometimes is inspired to put forth great energy when there is something presented that seems of value to him.

The search for motives and their effective injection into our health education for all ages is the prime challenge to public health workers.

"The Inquiring Reporter"—*Social Hygiene News* recently discovered the following in "The Inquiring Photographer" column of the *New York Daily News*:

. . . replies secured from casual passersby at a busy street corner to the question "Do you endorse the single standard of morals, as advocated by the New York Federation of Women's Clubs?" *The answers from 6 persons*—3 business men, 1 beauty culturist and 2 housewives, were unanimously "Yes, but the standard should be high."

Please send in any personal health questions you have proposed for use by the local "Inquiring Reporter."

Has anyone tried out an arrangement with a local newspaper for a weekly "Inquiring Health Reporter"? And did you submit the same questions and the answers already secured to a physician who could comment crisply and constructively?

A Dozen Marked Copies—Each new publication which you issue is likely to be of interest to certain editors and others who are not on your regular mailing lists. Why not make it an office rule that a specified number of copies, 10 to 15, come to your desk as a routine matter. These copies are for you to send personally to a picked list of those who might be especially interested in that particular publication and those who might be inclined to mention it or base an editorial on it.

If you can write an accompanying letter or memorandum or make it a "marked copy," so much the better.

Be sure to have the copies delivered to your desk where they will be in the way until they are disposed of.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

Motion Pictures in Germany—As reported in "Methods and Aims of Popular Health Education in Germany," by Professor Adam, secretary-general, Reich Committee on Popular Health Education (*World's Health*, Oct.-Dec., 1930):

The Committee has only a small number of films answering to the special requirements of cinema theatres. The only ones that have proved successful are, perhaps, the films on venereal disease: "False Shame" and "Accursed Heredity." All the other films of this class have failed, and after a short time have been withdrawn from circulation. Very few of the subsidiary films have met with success: the best were those prepared by the Committee itself under the title: "Health without Tears." The witty feature of this film consists of trick drawings, a tiny figure imparting the advice. The contrast between the dimensions of the drawing and the magnitude of the lesson it conveys is in itself amusing. These films were to some extent shown as the final item in the weekly programme; in this way it was possible to give advice on health problems to a public numbering several millions.

Pass It On—*Brookline Health Bulletin* and *Fall River Monthly Bulletin* are among those which "pass on" some of the good things already published in other house organs.

Why not do more of this? There is no particular merit in never repeating the effective messages written by others. All other divisions or bureaus find merit in using the procedures, the forms, the ideas used in common by hundreds of departments.

Talking It Over—Those of the mental hygiene society secretaries who can do so are meeting monthly to talk over their educational methods and materials. The annual sessions of the Public Education Section have a special use and value, but they do not take the place of more frequent and smaller gatherings. School health workers have done more of this than those engaged in popular health education.

Social work publicity councils are to be found in a number of cities. The first issue of *The Councillor* suggests what to do when you get together. *A copy free upon request to the editor of this department.*

"Prepare for Measles Outbreak Now"—What health departments can do about measles was discussed at a general conference attended by 150 people at Albany, N. Y. Among the suggested special services, as reported in *Health News*, New York State Department of Health (Feb. 2, 1931) is the following:

Provide for public instructions through newspaper items, addresses to civic organizations, and, as far as possible, through personal interviews by members of the medical and nursing force with families having young children.

The alert health worker will have a folder of material ready when the department or association program calls for measles publicity, and will have plans for a wider program than the above quotation calls for.

The Education of Givers—The need is illustrated in a readable article, "The Art of Giving," by S. A. Koenig, secretary of Henry Street Settlement. *Saturday Evening Post*. Jan. 31, 1931.

What to tell the giver and the potential giver, and how to tell it is a challenge to our skill and ingenuity.

REPORTING

The Nurse's Bag of the Visiting Nurse Assn., Colorado Springs, Colo., is the most condensed annual report we remember having seen. Half of the inside of the folder is given to a novel array of "bottles" labelled: "Health Supervision—2,854 Visits," "Prenatal Visits—320," and so on. 4 cents.

"It is *not* Far Fetched," says the title of the annual report of the Middletown, N. Y., Health Officer. The report proves that it is possible to produce with

the mimeograph a publication that is dignified, readable looking and amusingly illustrated. It tells what most citizens should know and what many are willing to learn—if properly presented. Dr. Shelley has an enthusiastic, skillful worker with the mimeograph.

Racine Board of Health likewise illustrates mimeograph possibilities. The report is bigger, more expensive, more impressive, and not so popular in style or contents. With a printed cover on attractive cover stock, printed diagrams, and *both contents and index* it is effective beyond many of the printed reports we see.

Texas State Department of Health again uses the mimeograph to produce a special publication. Now it is A Malaria Survey of 20,000 Rural School Children and What It Revealed in Texas. Eight readable pages with illustrations in color. We have asked for a description of the color method.

It looks interesting!—the 60th annual report of the Manhattan Eye, Ear and Throat Hospital, 210 East 64th St., New York, N. Y. The cover is a photograph in strong black and white contrast, with white block in which to print the most inviting contents. Inside photographs which “bleed,” run over the edge of the pages, paragraph captions at the bottom. Case stories, boxed, in small type. Text with headlines: “The Sick Poor: An Increasing Trust—So if we are to continue saying to all ‘Come on in!’—We Shall Need Increasing Gifts.” *Not until page 23* do we find the usual formal annual report title page, which precedes officers, staff, contributors, and so on.

“The High Spots of a 24 Year Program,” was the presidential address before the New Jersey Tuberculosis League, 21 Walnut St., Newark, N. J.

By word and picture the work of the West Virginia Department of Health is explained in its *Quarterly Bulletin*.

Jan., 1931. It is *not* an annual report. The type is a bit too small for the length of line.

The usual impressive report on May Day—National Child Health Day has been issued by American Child Health Assn., for 1930. The state by state reports are worth studying for the bewildering range of activities and ideas accepted in different sections as appropriate to the “Day,” as well as the evidence of widespread coöperation.

What noise does to city dwellers and what we could do about it is reported in *City Noise*, issued by Noise Abatement Commission, Department of Health, New York, N. Y. Much of the material could be used in other cities as is, or could be adapted to other localities. An aerial view of the city for both cover pages, and the chart of noise sources used as end papers, are effective. *Free*.

“A Second Look at First Principles,” by J. B. Pinney. *Journal of Social Hygiene*. Jan., 1931. These “comments on progress in social hygiene, with a record of work for the year 1930,” are supplemented by the Dec. 31, 1930, issue of *Social Hygiene News*. The map showing how different states have been served by the American Social Hygiene Assn., could be adapted to other state or county activities. The figures under “If You Like Statistics” relate largely to educational work.

HOLIDAY GREETINGS

We don't receive nearly all of the published bulletins or house organs, but a goodly share of those seen by the editor carried holiday messages, in addition to much Christmas Seal material.

Ask for copies now and file for inspiration's sake next winter.

The three first are the prize winners.

A cover design featuring “Christmas Health Club Now Forming,” with 3 pages of effective copy in large type—

the whole in red, green and black—on rough finish paper—in non-health-looking envelope—*Health*, Dept. of Health, New Haven, Conn.

"The Gifts of the Wise Men," a full page cover design; inside 3 pages given to three "gifts" of the Wise Men of science—toxin-antitoxin, vaccination and regular examinations—*Bulletin*, Milwaukee Health Dept.

A Christmas Greeting cover and 3 pages of health interpretation of Christmas—all in green and red—*Chicago's Health*, Chicago Health Dept.

A Happy New Year from the Commissioner of Health, and 3 pages on "The Challenge of 1931" in child welfare—*Chicago's Health*, Chicago Health Dept.

"Bonne Annee!" and "A Happy New Year!" messages in parallel columns—*Bulletin Sanitaire*, Provincial Bureau of Health, Montreal, Can.

A page on "Christmas Giving," quoted from Mary E. Richmond in *The Long View*—and a dignified Merry Christmas on the red cover—*Public Health News*, Oakland, Calif.

"Christmas Gifts for Betty," by Sudie E. Pyatt. A shoe-for-the-foot and diamond ring story—*Health Bulletin*, North Carolina Board of Health.

A modernistic Santa Claus surprised in the act and "Healthful New Year" on the cover—and two Christmas stories for the elementary schools—*School Health*, Tuberculosis and Health Society, 51 Warren Ave., West, Detroit, Mich.

"A surgical Santa Claus at the Crippled Children's Hospital"—a "Live to Live" editorial—"Is Santa Claus Dead?" (S. C. in the form of science)—*Pennsylvania's Health*, State Dept. of Health.

Green and red on the cover, official holiday greetings and Christmas in municipal hospitals—*Pittsburgh's Health*, Dept. of Public Health.

A safety message from Santa Claus

and other seasonal copy for publication—*Editor's Clip Sheet*, National Safety Council, 20 North Wacker Drive, Chicago, Ill.

"A New Year's Greeting," with a page of review of health progress and problems—*Health News*, New York State Dept. of Health.

On the cover an appreciation of co-operation, a pledge of service in 1931, and holiday greetings—*Illinois Arrow*, Ill. Tuberculosis Assn., Security Bldg., Springfield, Ill.

The mimeographed bulletin editors did nobly.

"Wishing Ye All A Grade 'A' Xmas"—a tree decorated with "A" bottles—an "old cowhand Santa Claus"—*Echoes from the Cowpen*, the milk standard bulletin, Texas Dept. of Health.

"Connecticut State Department of Health Sends Yuletide Greetings to all those who have Carried the Light of Health and Understanding and thereby Lessened Human Suffering in their Communities"—a sheet in old English accompanying the weekly bulletin.

"Every Connecticut Citizen—His Health Resolution for 1931"—9 resolves—*Weekly Health Bulletin*, Conn. Dept. of Health.

Christmas sketches—paragraphs on candy and toy dangers—a tree on the envelope—*Board of Health Bulletin*, Middletown, N. Y. "Mimeographed by Mildred Dillistin."

"A Merry and—Safe Christmas"—with sketches and advice—*Weekly Health Message*, Iowa Dept. of Health.

Christmas sketches and holiday messages with health morals—*News Letter*, West Virginia Dept. of Health.

NEW

Understanding the Child, Massachusetts Society for Mental Hygiene, 5 Joy St., Boston, Mass. Free to Massachusetts public school teachers. \$1.00 for 4 issues.

An *Industrial Nurse's Bulletin* is announced by New York Tuberculosis and Health Assn., 244 Madison Ave., New York, N. Y.

Illinois Tuberculosis Assn., Springfield, Mass., announces a mimeographed *School Health Bulletin* for teachers. 7 times in the year. From one to 9 copies to one address for 15 cents. Ten or more, 5 cents each.

A mimeographed, blue paper, *Legislative Bulletin*, being issued by Ohio Public Health Assn., Columbus, O., reports on all health proposals in the state legislature.

UNEMPLOYMENT AND PUBLIC HEALTH

A warning against the curtailment of public health programs, issued by Health Commissioner Parran, New York State, suggests that similar action may be desirable elsewhere. *Copy free.*

An experiment in feeding 4 healthy adults on a \$10.42 weekly grocer order is reported in *The Family*, 130 East 22d St., New York, N. Y. Reprints *free*. The suggested menus have been run in some daily papers.

Where health workers are participating in local unemployment activities they may wish to make sure that the leaders or executives have access to *Community Planning in Unemployment Emergencies* published by the Russell Sage Foundation and already distributed to local committees, chambers of commerce and community chests. Where

copies have not been received please write to editor of this department.

Food Thrift—Stretching the Food Dollar, by Jessie G. Cole. State Department of Health, Albany, N. Y. Title of a radio talk and of a pamphlet.

"Two Birds With One Stone." *Health Briefs*, State Department of Health, Nashville, Tenn. Emphasizes giving jobs to the unemployed because

It would hardly be exaggeration to state that there is not a single home in Tennessee that does not harbor some potential menace to the health or safety of that family. Most of these potential health menaces could be eliminated by the members of the family in a few spare hours and others may require the time of a carpenter, pipe fitter, plumber or some other tradesman who is anxious for employment.

DATES AHEAD

April 5-12—National Negro Health Week. Address: National Negro Health Week Committee, Howard University, Washington, D. C. Handbook and Poster. 5 cents each; 100 for \$12.50.

April 27-May 2—National Baby Week. Planned for department stores. Address Editor *Infants' and Children's Department*, Earnshaw Sales Co., 1 East 35th St., New York, N. Y., if interested in coöperating with local stores.

May 12—National Hospital Day. Address: American Hospital Assn., 18 East Division St., Chicago, Ill.

May 21—50th Birthday of American National Red Cross. Meetings or dinners by local chapters.

BOOKS AND REPORTS

Industrial Microbiology—By *Henry Field Smyth and Walter Lord Obold*. Baltimore: *Williams & Wilkins*, 1930. 313 pp., 2 pl. Price, \$6.00.

The function of this volume will probably be to call more widespread attention to the present and the growing importance of microbiological processes in industry. The book should have a distinct place if for no other reason than that it is the first attempt to bring together "what information is available in various scattered sources" since there is "no publication devoted primarily to this phase of mycology." The knowledge in this field is for the most part in a chaotic state. Information is often meager and incomplete. Certain processes have been of importance for centuries while others are almost of the present decade.

In meeting this condition the authors have maintained a completely non-critical style. Most of the book reads like a running abstract and summary of the literature covered. Though no claim is made to exhaustiveness so far as presentation is concerned, the bibliographies furnished seem fairly comprehensive.

The book as a whole covers the field well. The first few sections include discussions of the production of acids, alcohols and ketones. Later the production of certain food preparations and of enzyme preparations is taken up. Very important sections are given over to pointing out deleterious microbic effects as well as beneficial ones, and the modifying activities of organisms in processes which are not purely biological are discussed.

In the present state of our knowledge

a book of this kind must of necessity be more stimulating than informative, and most readers will probably find this true of the present volume. Enough information is available to give an indication as to the possibilities in the field of industrial microbiology, but in very few cases is there enough information to satisfy one's curiosity.

The book is by no means free from typographical errors, but few of them, if any, will cause serious misinterpretations. It gives evidence of a great amount of research, and is to be commended as a pioneer as well as a useful effort in a new direction. Each chapter ends with a good list of references.

ALLEN E. STEARN

Tuberculosis in Man and Lower Animals—By *H. H. Scott*. London: *His Majesty's Stationery Office*, 1930. Price, 4 s. net.

Among the many excellent reports issued by the Medical Research Council of England, this stands preëminent. The author draws on a wide experience with certain classes of human beings and many types of wild animals and birds in captivity. He reasserts the point held by a number of observers, but first, we believe, proved by Schlossmann and Engel, and later by the reviewer with Reichel, that tubercle bacilli may traverse the mucous membrane of the intestine without causing a local lesion, and pass through the lymphatic glands of the mesentery in the same manner. It may be remembered that in the controversy over intestinal tuberculosis, Koch held that before claiming such infection, a lesion should be found in the digestive tract.

Many other interesting features are recounted, and a table is given showing the main findings in 300 cases of human tuberculosis. A curious feature is the rarity of meningeal tuberculosis in animals, even monkeys, as compared with human beings.

Part 2, written in collaboration with John Beattie, gives a description of the lymphatic glands and vessels, too little known and too little taken into consideration by the average student of tuberculosis.

The one point on which we feel inclined to take issue with the author is the determination of the oldest lesion by the comparative amount of caseation and calcification in the neighboring glands.

There are some interesting comparisons between the disease as seen in human beings and in other primates. A study of this report can be recommended unreservedly to all students of tuberculosis.

M. P. RAVENEL

Principles of Women's Athletics—

By Florence A. Somers. New York: Barnes, 1930. 151 pp. Price, \$1.60.

An excellent discussion of the principles involved in women's athletics and of the need and procedures to safeguard adolescent girls and young women in their athletic activities.

The statement of objectives in athletics for women may be summarized as:

1. Provision for the opportunity for every girl to obtain the development inherent in athletic activities
2. The continuation of the play activities of childhood in the more suitable advanced games and sports of the adolescent girl and mature woman
3. The acquiring by the individual of a love for activity and a desire for outdoor recreation which will continue throughout life
4. The opportunity for the adequate social development of the individual through group relationships.

The fundamental factors bearing on the problem are:

A. Biological—does a girlhood of play and activity in sports build strength and endurance for the function of the woman?

B. Physiological—the major function of women being childbearing, the rate of growth in the female differing from that of the male, and the physical stature of the mature woman being different from that of the mature man, what should be our policy?

C. Sociological—the effect of education and custom on the mind of woman in its relation to the qualities sought for or derived from the participation of the modern girl in athletic activities as well as the inherent differences between woman and man.

D. Psychological—sex differences, if any, in mental traits.

Certain trends in athletic competition for girls and women seem dangerous physically, mentally, and socially. The increased popularity of sports has opened the door to unfortunate influences. The tendency toward public competition in athletic sports, which is unfortunately increased by placing women's competition in the Olympic games; the growth of school and town rivalry in which competition for girls is exploited; the type of publicity given girls' and women's sports on our sport pages; the attitude of a mentally abnormal group that women not only can but should do everything that men do; and the commercial phase where athletic clubs use the skill and athletic power of adolescent girls and women as a means of advertising and boosting their club, have made it extremely important that some guidance and control should be given to safeguard our girls and young women.

Attitudes should be developed in girls that shall lead to wholesome ideals and habits of sports. Sports should be chosen that can be used in after life. The selection of these activities should be determined by: sex, age tendencies and interests, needs and capacities, past experience, present facilities, time, and probable future opportunities. Those activities which are outstanding as being most used during leisure time are hiking,

swimming, tennis, dancing, camping, handball, and golf.

The book is concluded by a 10-page bibliography on athletics and other phases of physical education and hygiene. This supplies a much needed, concise, and well compiled statement of conditions and needs that should be in the hands of parents, school and university officials, physicians, and others interested in the welfare of girls and young women. CHARLES H. KEENE

Personal and Community Health—

By Claire Ellsmere Turner (3d ed.). St. Louis: Mosby, 1930. 443 pp. Price, \$2.75.

This convenient little volume is intended for the student at the university, college, normal or professional school. It is comprehensive—possibly unnecessarily so in some directions—covering Personal Health and Community Health with appendices on The Control of Communicable Disease and on Disinfection and Disinfectants. It has a good brief bibliography and a fairly complete index.

One can hardly review a book of this sort without first coming to some conclusion regarding the kind of thing which should be included in texts for the school and college student. Are such books intended to give the student demonstrated facts only or should they include various theories as well? Should the objective be to make him think for himself, especially regarding problems of community health? If so, the pros and cons should be given in detail.

The book under review inclines somewhat toward the magistral method: this being the case, much could be omitted to advantage. Some rather technical things have been emphasized (side chain theory; bacteriophage); unnecessary administrative detail also has been included (as in the section on school hy-

giene and that on the hygiene of reproduction). On the other hand, subjects in the field of preventive medicine, of interest to the layman, are more or less inadequately treated (diphtheria toxin-antitoxin; immunization against scarlet fever). Nutrition, too, hardly gets the balanced treatment which its interest and importance call for. Certain incursions into the medical field are somewhat misleading (as for example reference to incision of the ear drum).

It is easy, however, to find imbalance in most textbooks, especially those of the briefer kind; and criticism too readily becomes captious. On the whole, this book on personal and community health will, as in previous editions, be found most useful, especially in the hands of experienced teachers.

MERRILL E. CHAMPION

Clinical Allergy. Particularly Asthma and Hay Fever. Mechanism and Treatment—*By Francis M. Rackemann, M.D. New York: Macmillan, 1931. 617 pp. Price, \$10.50.*

Few subjects have proved to be of more interest to the physician, physiological chemist, and bacteriologist, and at the same time more puzzling, than allergy. In spite of the great amount of investigation which has been done, the phenomenon still holds many secrets, though much has been learned practically which is constantly being put to use in the treatment of the various manifestations of hypersensitiveness, its cure, and to a certain extent its prevention.

The volume before us is written particularly for the clinician and, as far as this aspect is concerned, it need not be reviewed in our columns. The history, chemistry, immunology, nature and origin of the reaction will be found of interest to those who are concerned in prevention. A truly staggering num-

ment adopted a babies' bib which carried upon it an inscription, "I don't want to be sick, please do not kiss me." This bib was sent to every baby born in Newark during the year. "Parents from all over the country and indeed all over the world wrote in for these bibs and commended the lesson it carried." One young mother wrote, "I have a beautiful baby that everyone wants to kiss, and I did not know how to stop them."

Reference is made to a decrease in puerperal deaths. Besides an increasing number of births in hospitals, it is noted that the Essex County Maternal Welfare Commission has done much in standardizing obstetrical methods and in following up by a questionnaire to the physicians in all cases where death has been reported as due to an accident of childbirth. Here, as elsewhere, it is observed that figures for puerperal deaths would be even more promising if the deaths due to abortion were not included in the total.

As a result of the immunization campaign, children in the kindergarten and first grades of parochial schools were 99 per cent immunized, and the total of all grades was about 70 per cent protected. For the whole city, about 55 per cent of the school children and 10 to 15 per cent of the preschool children have been immunized. No deaths from diphtheria of immunized children occurred.

Greenville, S. C.—In the 1930 annual report, it is noted that 114 cases of communicable diseases were reported during the year, as compared with 244 in 1929. There were no epidemics, no deaths from typhoid or scarlet fever, with 2 deaths (17 cases) from diphtheria. The tuberculosis death rate reported was 18 as compared with 40 in 1929.

A prenatal clinic is held weekly at the city hospital. Patients are care-

fully observed during confinement, and may be admitted free, if worthy, on the Duke Endowment Fund. Baby clinics are conducted twice a week at two hospitals. Indigent children are admitted from these clinics to the wards of the city hospital for the removal, without charge, of diseased adenoids and tonsils.

The chlorination of all dishes, cups, tableware and drinking glasses in places where food and drink are offered for sale to the public, is required by law. The new water supply, provided at Table Rock at a cost of 2 million dollars, is chlorinated. Health education and publicity work is carried on by the health department.

British Columbia—The 1930 report of the Provincial Board of Health indicates that much educational work has been carried on, including the distribution of 240,000 health pamphlets. The 138 Women's Institutes have made public health work the most important branch of their program and have been especially active in the schools.

Excellent photographs add interest to the report. The cultivation of oysters at several points on the coast line has been established on a profitable basis. Logging camps are periodically visited by sanitary officers. Fruit and vegetable canning establishments operate under health department regulations.

The travelling medical health officer reports 1,779 X-ray examinations, an activity made possible by the Christmas Seal sale. One hundred and eighty-six new cases of tuberculosis were thus discovered, besides 137 suspects.

On account of a scarlet fever epidemic in rural schools, a scarlet fever immunization campaign was instituted; 562 children were Dick tested; and 1,957 inoculations were given. In one city also, 688 children were tested and 1,931 inoculations were given, 597 children completing 5 inoculations. An attend-

ance of 3,241 at 108 child welfare clinics in the rural districts is reported. A comprehensive report is made of the work of the Saanich full-time health unit which serves a rural and suburban district about 55 square miles in area, with 14,000 inhabitants. The percentage of attendance in schools has increased from 82.9 before the unit was organized, to 92.4 for the past 2 years. The costs of isolation in the hospital meanwhile decreased from \$1,200 to \$5,500 a year before the unit was organized, to \$350 in 1930. During the past 2 years, 600 children were immunized against diphtheria.

San Diego, Calif.—During 1929, 484 dairy herds comprising 11,145 dairy animals were tuberculin tested and 193, or 1.7 per cent, were found to be reactors and were slaughtered. Two surprise milk contests conducted by the State Bureau of Dairy Control gave an average of over 95 per cent. The purpose of the contests is to check results and methods of the local health department. All laboratory tests obtained by the department between contests, as well as samples taken on the day of the contest, are scored.

A birth rate of 20.1 and a resident death rate of 14 are recorded on the basis of an estimated population of 119,700. An infant mortality rate of 48.7 is noted. Personal injuries and fatalities due to automobile accidents are analyzed. Of 1,042 persons injured, 195 were pedestrians. There were 63 deaths from this cause, 12 of which were of children under 15 years of age. Thirty decedents were occupants of automobiles when the accident occurred, 3 were on motorcycles, 2 on bicycles, 1 on a scooter and the remainder were pedestrians. On the basis of a 1930 population of 147,897, the death rate from accidents that occurred in the city was 35.8. The San Diego Public Safety

Committee, sponsored by the Automobile Club, was organized in 1923 and meets weekly. The Board of Health in 1929 went on record as deploring the loss of life and property damage, due to confusion in laws and lack of proper enforcement, and favored a modern, well equipped traffic bureau. The Police Department traffic division has paid special attention to safeguarding school children.

Providence, R. I.—Reports of the Superintendent of Health, the city registrar, and the inspector of milk of Providence are read with more than usual interest because of their comprehensive nature. The 1929 reports are interesting, enlightening and well printed. The 1930 census recorded a population of 252,981. On the basis of an estimated population of 276,400 in 1929, a birth rate of 20.36, a death rate of 13.12, and a marriage rate of 15.6 were calculated. Total expenditures of the health department in 1929 amounted to \$93,719 as compared with \$88,818 in 1928. A classified financial table shows the details.

The superintendent's report opens with a review of the public health survey conducted in 1929 under the auspices of the Community Fund and a local advisory group by the Committee on Administrative Practice of the American Public Health Association. Several of the recommendations of the survey have already been carried out and others are in progress. On the basis of the *Appraisal Form for Cities*, Providence received a rating for the year 1928 of 817.2 points. The highest ratings were for vital statistics, infant hygiene, and laboratory services.

Six nurses of the health department supervise children delivered by midwives until they are 4 years old, making 14 calls on each well baby before it is one year of age, 4 calls during the 2d

year, and 2 calls a year thereafter. If a baby becomes sick, additional visits are made as indicated. One nurse supervises the infants and young children in licensed boarding homes, and the infants of such unmarried mothers as are not under the nursing service of private agencies. One nurse makes a visit to each infant delivered by a physician provided the mother is not on the maternity service of the District Nursing Association, or is a ward patient at the Lying-in Hospital. Coöperating with the State Children's Bureau, this nurse also visits periodically the licensed maternity homes and some of the day nurseries. The Providence District Nursing Association employs on its children's service 19 staff nurses and 2 pupil nurses, with 2 supervisors. Fifteen child welfare stations were carried on by the Child Welfare Committee, the examining physicians being engaged and paid by the health department. An in-

fant mortality rate of 66 is recorded for 1929, the average for the past 10 years being 74. An excellent statistical table is presented showing deaths of infants by years according to nativity.

During 1929, the city ordinance governing food handlers was amended to allow those willing and able to pay their own physicians for an examination to do so, provided the physician would follow the examination form prescribed by the department. During 1929, 317 persons took advantage of this amendment. In 1929, 5,617 examinations were made at the City Hospital.

One of the several interesting statistical tables gives the unreported cases of communicable diseases discovered by the department and the number without a physician for the past 11 years, with reference to a previous table going back to 1891. This series of reports will be studied with profit by health administrators.

BOOKS RECEIVED

- A SYSTEM OF BACTERIOLOGY IN RELATION TO MEDICINE. Vol. I. Various Authors. London: His Majesty's Stationery Office, 1930. 374 pp. Price, \$6.00.
- A MANUAL OF THE COMMON CONTAGIOUS DISEASES. By Philip Moen Stimson. Philadelphia: Lea & Febiger, 1931. 351 pp. Price, \$3.75.
- DOCTORS AND SPECIALISTS. By Morris Fishbein. Indianapolis: Bobbs-Merrill, 1930. 118 pp. Price, \$1.00.
- ETHICS: TALKS TO NURSES. By Mary E. Gladwin. Philadelphia: Saunders, 1930. 281 pp. Price, \$2.00.
- NURSING IN THE ACUTE INFECTIOUS DISEASES. 5th ed. By George P. Paul. Philadelphia: Saunders, 1930. 295 pp. Price, \$1.75.
- GROW THIN ON GOOD FOOD. By Luella E. AxteLL. New York: Funk & Wagnalls, 1930. 336 pp. Price, \$2.00.
- PRACTICAL APPLICATIONS OF HEREDITY. By Paul Popenoe. Baltimore: Williams & Wilkins, 1930. 128 pp. Price, \$1.00.
- PERSONAL AND PUBLIC HEALTH. A Text in Health Education. By William E. Burkard, Raymond L. Chambers and Frederick W. Maroney. New York: Lyons & Carnahan, 1930. 516 pp. Price, \$1.08.
- SAFETY TOWN STORIES. By Mildred Miles Roberts. New York: Lyons & Carnahan, 1930. 96 pp. Price, \$6.00.
- SCIENCE IN THE SERVICE OF HEALTH. By Elliot R. Downing. New York: Longmans, Green, 1930. 320 pp. Price, \$2.00.
- A STUDY OF THE DENTAL PROBLEM IN HAWAII. By Guy S. Milberry. San Francisco: University of California, College of Dentistry, 1930. 158 pp.
- ELEMENTS OF WATER BACTERIOLOGY. 5th ed. rev. By Samuel Cate Prescott and Charles-Edward A. Winslow. New York: Wiley, 1931. 219 pp. Price, \$2.50.
- A SYSTEM OF BACTERIOLOGY IN RELATION TO MEDICINE. Vol. VII. Various Authors. London: His Majesty's Stationery Office, 1930. 509 pp. Price, \$6.00.
- NATIONAL CONFERENCE OF SOCIAL WORK, Boston, 1930. Chicago: University of Chicago Press, 1931. 710 pp. Price, \$3.00.
- STUDY GUIDE TEST-BOOK IN MATERIA MEDICA. By A. S. Blumgarten. New York: Macmillan, 1930. 97 pp. Price, \$1.35.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON. PH. D.

Percutaneous Diphtheria Immunization—Administration of diphtheria anatoxin in an oily base (Lowenstein) by rubbing into the skin has advantages which make it the method to be preferred, assert these authors.

ABT, A. F., and FEINGOLD, B. F. Diphtheria Immunization. *Am. J. Dis. Child.*, 41, 1: 8 (Jan.), 1931.

Which Birth Rates Fall?—Those who view with alarm the falling birth rate would do well to pause before this Massachusetts statistical study which finds a slight, but definite, increase in birth rates among native born parents. The much discussed general decline is due to the decrease in the rate among foreign born parents who are growing older, quite obviously.

BIGELOW, G. H., and HAMBLEY, A. D. Our Falling Birth Rate. *New Eng. J. Med.*, 204, 5: 209 (Jan. 29), 1931.

Etiology of Encephalitis—Although we have been spared encephalitis following vaccination, as sanitarians we ought to know the opinions and findings of Europe regarding the phenomenon. This paper seems to be an able dissertation on that and related subjects.

BRAIN, W. R. Zoster, Varicella and Encephalitis. *Brit. M. J.*, 3654: 81 (Jan. 17), 1931.

Value of Health Examinations—For the "hardboiled" critics who are wont to question the true worth of health examinations, there is an answer in this study of the effect of medical examinations on life insurance mortality.

BRITTON, R. O. Effect on Life Insurance Mortality Rates of Rejection of Applicants on the Basis of Medical Examination. *Pub. Health Rep.*, 46, 2: 46 (Jan. 9), 1931.

Etiology of Arthritis—Evidence is presented in support of the proposition that rheumatoid arthritis is a streptococcal infection, in which the streptococci are discharged from a primary focus, circulate in the blood stream, and localize in certain joints where they establish a secondary infection.

CROFT, R. L., *et al.* The Etiology of Rheumatoid Arthritis. *Am. J. Med. Sci.*, 131, 1: 12 (Jan.), 1931.

School Ventilation Again—Two findings are recorded: halving the standard rate of air flow had no demonstrable effect upon the pupils' health, and children in window ventilated rooms were just as free from colds as those in rooms mechanically ventilated.

COLE, R., *et al.* A Study of Ventilation and Respiratory Illness in New York Schools; Comparison of Window-Gravity Ventilation and of Unit Fan Ventilation with Varying Air Flow. *Am. J. Hyg.*, 13, 1: 235 (Jan.), 1931.

What is a Stillbirth?—The variety of definitions of what constitutes a stillbirth, and the effect of the various definitions upon infant mortality statistics will astonish those who have supposed a stillbirth to be always a stillbirth.

GAGNON, G. What Is a Stillbirth? *Canada Pub. Health J.*, 22, 1: 16 (Jan.), 1931.

Filtrable Stages of Bacteria—Among many highly significant demonstrations, the authors of this important communication include the following: the possibility of cultivating in pure lines the filtrable, virus-like stage of a Shiga bacillus, which may be caused to revert to the original cell type with all the original characteristics. The most important contribution of the month to public health literature.

HADLEY, P., *et al.* The Filtrable Forms of

Bacteria: I. A Filtrable Stage in the Life History of the Shiga Dysentery Bacillus. J. Infect. Dis., 48, 1: 1 (Jan.), 1931.

Hearts and High School Athletics—Physical education and athletics may injure the heart. How such injury was avoided in the Pittsburgh High Schools is a worth while contribution to public health literature.

KERR, A. M. Safeguarding the Heart in High School. J. Health & Phys. Ed., 2, 1: 16 (Jan.), 1931.

Tuberculosis Prevention—This excellent, easily understandable account of the operation of the Massachusetts State Health Department's "Chadwick Clinics" tells of the coöperation between the official and voluntary agencies in the preventive measures that follow in the wake of the diagnostic clinics. A lesson badly needed in those states where mutual distrust marks the official-unofficial relationship.

KIERNAN, F. The Social Significance of the Ten Year School Clinic Program for Children in Massachusetts. New Eng. J. Med., 204, 3: 116 (Jan 15), 1931.

Convalescent Measles Serum—A British report of the successful use of pooled convalescent measles serum. This record may be of value to American sanitarians doing research in this field of disease prevention.

NABARRO, D. N., and SIGNY, A. G. Convalescent Serum in Prophylaxis of Measles. Brit. Med. J., 3652: 12 (Jan. 3), 1931.

Physical Education and Health—Sanitarians would do well to read this excellent discussion of the health objectives of physical education which aims to achieve its purpose by building capacity for exercise, freeing the body from handicaps and establishing health habits.

NASH, J. B. Administration of Physical Education and Health in the Light of General Education Needs. J. Health & Phys. Ed., 1, 10: 9 (Dec.), 1930.

Arthritis Control Program—An illuminating discussion of the possibility of a program for the prevention and control of arthritis administered along state lines. Though centered in Massachusetts, the application is nation-wide.

OSGOOD, R. B. The Control of Arthritis. New Eng. J. Med., 204, 2: 55 (Jan. 8), 1931.

Persistence of Diphtheria Immunity—That the antitoxin content of the blood serum obtained by the use of anatoxin does not diminish with time, is the finding of these French researchers.

RAMON, G., *et al.* Value and Duration of Immunity Conferred by Antidiphtheria Anatoxin. Am. J. Dis. Child., 41, 1: 1 (Jan.), 1931.

Water Bacteriology—A new system for the bacteriological examination of water is proposed, which differs from the standard methods, among other ways, by the substitution of crystal violet for brilliant green in culture media.

SALLE, A. J. A System for the Bacteriologic Examination of Water. J. Bact., 20, 6: 381 (Dec.), 1930.

Applied Mental Hygiene—The reasons why mental hygiene cannot be formulated into general rules as is done with physical hygiene are so well stated that this paper is worth study from that angle alone, not to mention other virtues in it.

SULLIVAN, E. A. Mental Hygiene as Applied to the College Freshman. New Eng. J. Med., 204, 2: 62 (Jan. 8), 1931.

Influenza and Social Status—The glib statement that influenza is no respecter of persons will not stand statistical scrutiny. This paper reports a definitely greater fatality especially in older persons, in the lower economic classes.

SYDENSTRICKER, E. The Incidence of Influenza Among Persons of Different Economic Status during the Epidemic of 1918. Pub. Health Rep., 46, 4: 154 (Jan. 23), 1931.

NEWS FROM THE FIELD

CALIFORNIA'S NEW STATE HEALTH OFFICER

GILES S. PORTER has been appointed by Governor James Rolph, Jr., as State Health Officer of California, succeeding Dr. Walter M. Dickie. Dr. Porter has been Deputy Health Officer of Los Angeles for many years, serving under the late Dr. Powers, as well as Dr. Parrish. Dr. George C. Sabichi of Bakersfield has been appointed State Epidemiologist by the Governor.

FRENCH NATIONAL COMMITTEE FOR THE PREVENTION OF BLINDNESS

THE French National Committee for the Prevention of Blindness, similar in aims to the American National Society for the Prevention of Blindness, has recently been formed in Paris. Its president, Dr. de Lapersonne, is also president of the International Association for Prevention of Blindness.

ADDITIONAL CASES OF JAMAICA GINGER PARALYSIS

THE U. S. Public Health Service is in receipt of information which indicates that cases of Jamaica ginger paralysis are still occurring in the United States.

Some months ago it was announced by the Public Health Service that the cause of Jamaica ginger paralysis had been determined to be tri-ortho-cresyl phosphate, which evidently had been used as an adulterant in the manufacture of Jamaica ginger extract.

LEAD POISONING FROM TOYS

LEADING pediatricians announce the occurrence of a number of cases of lead poisoning in infants and children,

apparently due to biting lead paint from cribs, toys, etc. The U. S. Public Health Service has previously called attention to this possible source of lead poisoning but it is likely that more cases occur than become known. Though lead paint has wide fields of usefulness, the painting of babies' toys and cribs is not one of them. It is presumed the manufacturers of these articles will see to it that lead paint is not used for this purpose, but warning is necessary that parents, especially in repainting cribs, should use paints which are free from lead.

THIRTEENTH TEXAS WATER WORKS SHORT SCHOOL

THE Thirteenth Texas Water Works Short School assembled in Waco, Tex.—laboratory sessions January 16-20 and general sessions January 20-23, with 210 total registration. Mineral Wells was selected as the next meeting place.

New officers for 1931 are: L. A. Grimes, Abilene, President; J. D. Rogers, Port Arthur, First Vice-President; Clyde C. Hays, Waco, Second Vice-President; Charles M. Crawford, Childress, Third Vice-President; and Dr. E. P. Schoch, Austin, Fourth Vice-President.

INTERNATIONAL CHILD WELFARE

THE Second International Conference of Social Work will be held in Frankfort-on-Main, Germany, in July, 1932. Its general theme will be social work and the family. The conference will be organized by the executive board of the permanent committee appointed by the First International Conference, which was held in Paris in 1928. Dr.

Alice Masarykova of Czechoslovakia is chairman of the board; and Mary Van Kleeck of New York, as one of the vice-presidents, represents the United States. Applications for membership are received at the Secretariat of the conference, Stiftstrasse 30, Frankfurt-on-Main.

PERSONALS

ANNA E. RICHARDSON, nationally known as an educator and home economist, died in Washington, D. C., on February 3, 1931. She had been suffering from heart trouble for some months, but the end came suddenly.

MARY EMMA SMITH, R.N., of Little Rock, Ark., has been appointed Director of Nursing Activities of the National Society for the Prevention of Blindness, to succeed Mrs. John B. Chambers, who resigned. C. Edith Kerby has been appointed Statistician, a newly created position.

DR. RICHARD R. LYTLE, who for 35 years was contagious disease diagnostician for the New York City Board of Health, died on January 31. He was 78 years old and had practised medicine here until his retirement several years ago.

CONFERENCES

Mar. 23-27, College of Physicians, Baltimore, Md.

Apr. 2-3, Iowa Public Health Association, Des Moines, Ia.

Apr. 2-4, Association of Anatomists, Chicago, Ill.

Apr. 12-15, Tenth Annual Convention, International Society for Crippled Children, Cleveland, O.

Apr. 13-16, American Red Cross, National Convention, Washington, D. C.

Apr. 14-20, World Conference on Work for the Blind, New York, N. Y.

Apr. 20-23, New England Health Institute, Portland, Me.

Apr. 29-30, Conference of State and

Provincial Health Authorities of North America, Washington, D. C.
May 5-6, National Conference on College Hygiene, University of Syracuse, Syracuse, N. Y.

May 28-30, Western Branch A. P. H. A., Seattle, Wash.

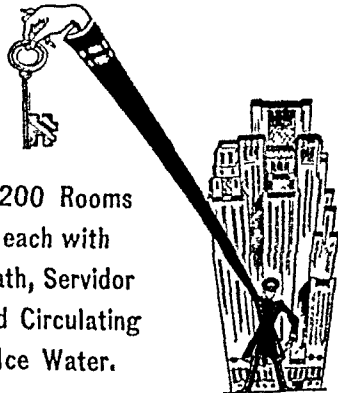
May 11-14, National Tuberculosis Association, Syracuse, N. Y.

May 19-24, Congress of the Royal Institute of Public Health, Frankfurt-on-Main, Germany

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and THE NATION'S HEALTH Vol. XIII No. 4

Volume XXI

April, 1931

Number 4

Flocculation Experiments with Variola and Vaccinia Virus*

LEON C. HAVENS, M. D., AND CATHERINE R. MAYFIELD

Laboratories of Alabama State Board of Health, Montgomery, Ala.

IMMUNOLOGICAL studies of viruses have shown clearly and uniformly that virucidal properties are developed in the serum of animals following an attack of the disease and in some instances following injection of the killed virus. The demonstration of agglutinins, precipitins or complement-fixing antibodies has not been so convincing and, in contrast to bacterial antigens, doubt exists whether the viruses, as a class, are capable of stimulating such antibodies. Fairly clear-cut evidence, both for and against their existence, has been recorded.

Gordon¹ has described specific complement-fixation and flocculation with vaccinia and variola, and Burgess, Craigie and Tulloch² have utilized the flocculation test as a practical diagnostic procedure for the differentiation of smallpox and chicken pox. Takaki and Koref³ used complement-fixation to identify the viruses of herpes, rabies and encephalitis. Ciuca⁴ reports successful complement-fixation experiments with the virus of foot and mouth disease and Bedson and Bland,⁵ in addition to a number of other investigators, have confirmed Gordon's results with vaccinia. Recently, Frobisher⁶ has reported complement-fixation reactions with the virus of yellow fever and the serums of men and monkeys.

In contrast to these findings, indicating that viruses are similar to bacterial antigens in the production of antibodies, Schultz, Bullock and Lawrence,⁷ among others, were unable to demonstrate any other than specific neutralizing antibodies in the serum of rabbits immunized against vaccinia. Ward⁸ reports negative complement-fixation experi-

* Read before the Laboratory Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 29, 1930.

It is our purpose to describe the production of anti-vaccinia flocculating serum in the rabbit and in the human subject, the successful demonstration of specific flocculation of vaccinia virus by its antiserum, as well as observations of the usefulness of the reaction as a practical diagnostic test.

Serums Nos. 1, 2, 3 and 4 were obtained from rabbits vaccinated intradermally with 2d passage rabbit dermal virus. The backs were

TABLE I
PRODUCTION OF ANTI-VACCINIA FLOCCULATING SERUMS

Rabbit No. 5 Intravenous Dermal Virus Potency 1 : 8,000			Rabbit No. 6 Subcutaneous Dermal Virus Potency 1 : 8,000			Rabbit No. 8 Intravenous Brain Virus Potency 1 : 200,000			Rabbit No. 9 Subcutaneous Brain Virus Potency 1 : 200,000			Rabbit No. 11 Intravenous Brain Virus Potency 1 : 150,000		
Date	Amt. Virus (gms.)	Vol. (c.c.)	Date	Amt. Virus (gms.)	Vol. (c.c.)	Date	Amt. Virus (gms.)	Vol. (c.c.)	Date	Amt. Virus (gms.)	Vol. (c.c.)	Date	Amt. Virus (gms.)	Vol. (c.c.)
1-22	0.001	0.1	1-22	0.005	0.5	2-18	0.005	0.1	2-17	0.025	0.5	5-22	0.003	0.1
1-23	0.002	0.2	1-23	0.005	0.5	2-19	0.005	0.1	2-18	0.025	0.5	5-23	0.006	0.2
1-24	0.002	0.2	1-24	0.005	0.5	2-22	0.005	0.1	2-19	0.05	1.0	5-24	0.010	0.2
1-28	0.003	0.3	1-28	0.01	1.0	2-23	0.01	0.2	2-22	0.05	0.5	5-27	0.010	0.1
1-29	0.005	0.5	1-29	0.01	1.0	2-24	0.01	0.2	2-23	0.1	1.0	5-28	0.020	0.2
1-30	0.005	0.5	1-30	0.02	2.0	2-27	0.01	0.2	2-24	0.1	1.0	5-29	0.025	0.5
2-3	0.01	1.0	2-3	0.02	2.0	2-28	0.025	0.5	2-27	0.2	1.0	6-2	0.025	0.5
2-4	0.02	2.0	2-4	0.03	3.0	3-1	0.025	0.5	2-28	0.2	1.0	6-4	0.05	1.0
2-5	0.02	2.0	2-5	0.05	5.0	3-8	Bled.	Titer	3-1	0.4	2.0	6-5	0.025	0.5
2-12	Bled.	Titer 1 : 32	2-12	Bled.	Titer 1 : 32			1 : 64	3-8	Bled.	Titer 1 : 32	6-11	0.025	0.5
												6-12	0.03	0.6
												6-13	0.03	0.6
												6-20	Bled.	Titer 1 : 64

denuded of hair from the shoulders to the flanks, the skin scarified and inoculated with vaccinia virus harvested from another rabbit similarly vaccinated. These serums, obtained 12–14 days following inoculation, yielded on the whole as satisfactory titers as those obtained by intravenous and subcutaneous inoculations. Two rabbits, inoculated intraperitoneally, according to the general scheme of the intravenous and subcutaneous injections, failed to yield a flocculating serum. The rabbits were bled from the heart, the serums removed from the clots and stored under aseptic conditions without addition of preservative and without inactivation.

We have not succeeded in obtaining in the rabbit a higher titer than 1:64, either with dermal or brain virus. Efforts to increase the potency of the serum by injecting large amounts of virus failed, particularly in the case of the brain virus, due to the fact that intravenous injections of brain tissue in amounts larger than 0.5 c.c. of a 1:20 suspension usually caused immediately fatal convulsions. Subcutaneous injections of brain virus up to 0.4 gm. failed, in the case of 2 rabbits, to produce a higher titer than 1:32. The titrations of the serums are given in Table II.

TABLE II
TITRATION OF ANTI-VACCINIA FLOCCULATING SERUMS

Se- rum	Method of Inoculation	Virus Used	Titer Before Immuni- zation	Dermal Virus (1 : 100)					Brain Virus (1 : 100)				
				1 : 8	1 : 16	1 : 32	1 : 64	1 : 128	1 : 8	1 : 16	1 : 32	1 : 64	1 : 128
1	Intradermal	Dermal	—	++	++	++	+	—	0	0	0	0	0
2	"	"	—	++	++	+	—	—	++	++	+	—	—
3	"	"	—	++	++	++	++	±	0	0	0	0	0
4	"	"	—	++	++	++	+	—	+	+	+	—	—
5	Intravenous	"	—	++	++	+	±	—	++	++	+	—	—
6	Subcutaneous	"	—	++	++	++	—	—	++	+	+	—	—
7	Intraperi- toneal	"	—	+	±	—	—	—	±	—	—	—	—
8	Intravenous	Brain	—	++	++	+	±	—	++	++	++	++	—
9	Subcutaneous	"	—	0	0	0	0	0	++	++	+	—	—
11	Intravenous	"	—	++	++	++	—	—	++	++	++	+	—

++ = Heavy precipitation visible at bottom of tube
 + = Light but definite precipitate
 ± = Very slight precipitation
 — = No precipitation in dilution of serum 1 : 8
 0 = Not tested

Preparation of the Antigens for the Tests—The antigens used in the tests, whether of dermal or brain origin, were first ground in a mortar with the addition of small amounts of 0.85 per cent sodium chloride solution. After thorough grinding and further dilution with

salt solution to make an approximate 1:100 suspension, the material was centrifugated for 2 minutes at 2,000 r.p.m. The supernatant suspension was then diluted until the turbidity was equal to that of BaSO₄ standard No. 1. This was found to be approximately the turbidity of the supernatant of a 1:100 suspension of rabbit brain after centrifugation. Where more dilute antigenic suspensions were used, they were prepared by dilution of the 1:100 suspensions with salt solution. Usually 1:100 suspensions, which, after centrifugation, were only slightly turbid, gave satisfactory results, but in some experiments more dilute antigens, even 1:1,000, flocculated well (see Table IX). As a rule, heavier suspensions, such as 1:20 or 1:50, did not give as heavy a precipitate as did 1:100 or even more dilute. This is illustrated with a brain virus in Table IV.

Titration of Potency of Antigens—The potency of all antigens, both dermal and brain, was determined by intradermal injection into the denuded backs of rabbits of 0.05 c.c. amounts of serial dilutions of the virus. The titer of a given virus was taken as the highest dilution which caused a definite lesion.

Technic of the Tests—Serological tubes (10 x 100 mm.) were used. Serial dilutions of the flocculating serum were placed in the tubes in 0.3 c.c. amounts and to each was added 0.3 c.c. of the antigenic suspension. Controls with salt solution and normal rabbit serum were included for each antigen. The tests were incubated in a water bath at 37° C., readings usually being made at 1, 2, 4, 6 and 18 hours. When the titer of a serum was being determined the 24-hour reading was taken as final.

A few ring tests were also made, both with undiluted serum and serial dilutions of antigen, and *vice versa*. While a definite ring usually formed with appropriate dilutions of antigen or serum, the results, on the whole, were not so clear-cut as with flocculation. Incubation of the tests at 56° C., as recommended by Gordon¹ and Burgess, Craigie and Tulloch,² gave indifferent results. The amount of flocculation was never great and rarely occurred except in low dilutions of serum.

Specificity of the Reaction—The unequivocal and consistent flocculation obtained with brain vaccinia and immune serum prepared by injection of brain virus can hardly be interpreted in any other way than as the result of a specific reaction between vaccinia virus and the immune serum. In view of negative results reported by Schultz and his coworkers³ with brain virus free of bacteria and his contention that the precipitation obtained with dermal virus was due to contaminating bacteria, this point has been investigated and the absorption experiments described by Burgess, Craigie and Tulloch repeated.

TABLE III

ABSORPTION EXPERIMENTS WITH BACTERIA DERIVED FROM RABBIT SKIN

Serum	No. 1				No. 2				No. 3				No. 4	
	Unabsorbed Serum				Absorbed with Dermal Virus				Absorbed with S1, S2, and S3				Absorbed with S3	
	Tested with				Tested with				Tested with				Tested with	
	Dermal Virus	S1	S2	S3	Dermal Virus	S1	S2	S3	Dermal Virus	S1	S2	S3	Dermal Virus	S3
1	64	32	32	64	0	32	32	64	64	0	0	0	64	8
5	64	8	32	128	0	8	32	128	64	0	0	8	64	0
6	32	4	16	64	0	8	16	64	32	0	0	8	32	0
8	32	4	128	64	0	8	128	64	32	0	0	0	32	8

Figures = highest dilution of serum in which definite flocculation occurred

0 = no flocculation in dilution 1:8

Serum (0.3 c.c.) absorbed with 1.2 c.c. of 1-10 suspension of washed and packed bacteria (centrifuged 2,000 r.p.m. for 20 minutes)

Serum (0.5 c.c.) absorbed with 2.0 c.c. of 1:20 suspension dermal virus

Absorption for 1 hour at 37° C.

The serum of every rabbit which we have examined, some 2 dozen in all, contains agglutinins, occasionally in dilutions as high as 1:128, for one or more of 8 or 10 strains of bacteria, mostly staphylococci, isolated from rabbit skin and dermal (rabbit) vaccinia virus. Furthermore, when dermal virus is used for immunization, the titer of the serum for some of these staphylococci is frequently raised, due to their presence in the crusts from which the suspensions for injection are prepared. The rabbits (5 in number) immunized with brain virus, free of ordinary bacteria, have all yielded an unchanged titer for these organisms, following the course of immunization.

The results of absorption tests with 3 different strains of staphylococci (S1, S2, and S3) and 4 anti-vaccinia flocculating serums are given in Table III. The results lead to the conclusion that the flocculation obtained with vaccinia virus, either dermal or brain, is specific. Removal of the antibodies for the staphylococcus strains did not affect the flocculating properties of the serum for the virus. On the other hand, removal of the vaccinia antibodies by absorption with dermal virus left the agglutinins and precipitins for the staphylococci unchanged.

The experiments further show that, as Smith⁹ has observed, viruses behave in the same way as bacteria in respect to the specific absorption of antibodies. There is one difference, however, which may be more apparent than real, although it has been noted by other observers, such as Burgess, Craigie and Tulloch,² and Andrewes,¹⁰ as well as

Smith. This is in the seemingly large amount of vaccinia antigen required for complete removal of the antibodies, even from a serum of comparatively low titer. We have observed that under conditions of our experiments, approximately 0.1 gm. of dried dermal virus (potency 1:8,000) or 2 c.c. of 1:20 centrifuged suspension is required to absorb completely the flocculating antibodies from 0.5 c.c. of serums which have a titer of 1:32–1:64. Compared with the number of bacteria required for complete absorption of specific agglutinins from antibacterial serums many times more active than anti-vaccinia flocculating serum, the amount of virus required for absorption of the latter seems excessively large.

We may assume, however, that in a virus of a potency such that 0.05 c.c. of a 1:8,000 dilution is the smallest amount which will produce a lesion after intradermal injection, the specific antigen present is a very small part of the whole and may be comparable to the amount necessary for absorption in the case of bacterial agglutinins.

Effect of Varying Concentrations of Antigen—That optimum concentrations of antigen for flocculation exist is indicated by the results with a brain virus recorded in Table IV. It is seen that concentrations greater than 1:50 failed to flocculate, whereas the best results were obtained with concentrations around 1:100.

TABLE IV

EFFECT OF VARYING CONCENTRATIONS OF ANTIGEN (BRAIN VIRUS)
ON FLOCCULATION BY ANTI-VACCINIA SERUM

Antigen Dilution	Serum No. 2				Serum No. 5				Serum No. 8				Serum No. 9			
	1:8	1:16	1:32	1:64	1:8	1:16	1:32	1:64	1:8	1:16	1:32	1:64	1:8	1:16	1:32	1:64
1:5.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1:10.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1:20.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
1:50.....	++	+	—	—	+	+	—	—	++	+	+	+	++	++	++	—
1:100.....	++	++	—	—	++	++	++	—	++	++	++	++	++	++	++	+
1:200.....	++	++	—	—	++	++	+	—	++	++	++	+	++	++	+	+
1:500.....	+	+	—	—	+	+	—	—	++	++	++	—	+	+	—	—
1:1,000.....	+	+	—	—	+	+	—	—	++	+	—	—	+	—	—	—
1:2,000.....	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—

Diagnostic Tests with Scabs from Chicken Pox and Smallpox Patients—In Table V are given the results of flocculation tests with 42 specimens collected from clinical cases of smallpox, vaccinia and chicken pox. Material was obtained from 28 cases of chicken pox, 9 cases of smallpox and 5 human vaccinations. The scabs were prepared for the tests according to the method already described for the

TABLE V

FLOCCULATION TESTS WITH SCABS FROM CLINICAL CASES OF SMALLPOX AND CHICKEN POX

No. of Specimen	Clinical Diagnosis	Age	Race	Sex	Anti-Vaccinia Serum									Normal Rabbit Serum			Salt Sol.
					No. 3			No. 6			No. 8						
					1:8	1:16	1:32	1:8	1:16	1:32	1:8	1:16	1:32	1:8	1:16	1:32	
1	Chicken pox	10	W	M	+	+	-	0	0	0	0	0	0	++	++	+	-
2	Chicken pox	6	W	F	+	+	+	0	0	0	0	0	0	++	++	+	-
3	Chicken pox	4	W	F	+	+	-	0	0	0	0	0	0	++	+	+	-
4	Chicken pox	12	W	M	-	-	-	0	0	0	0	0	0	+	+	-	-
5	Chicken pox	13	W	M	++	+	-	0	0	0	0	0	0	++	+	+	-
6	Chicken pox	9	W	M	++	+	+	0	0	0	0	0	0	++	++	+	-
7	Vaccinia-human .	30	W	M	++	++	++	++	+	+	+	+	+	-	-	-	-
8	Chicken pox	8	W	M	+	+	-	0	+	+	+	0	0	±	-	-	-
9	Smallpox.....	24	C	F	++	++	++	++	++	+	+	+	0	±	-	-	-
10	Chicken pox	7	C	F	-	-	-	0	+	+	+	+	+	+	+	+	-
11	Chicken pox	5	W	M	0	0	0	+	+	+	+	+	+	++	++	+	-
12	Chicken pox	8	W	M	0	0	0	+	+	+	+	++	++	+	++	+	-
13	Chicken pox	9	W	F	0	0	0	-	-	-	-	-	-	-	-	-	-
14	Chicken pox	6	C	F	0	0	0	-	-	-	-	-	-	-	-	-	-
15	Chicken pox.....	8	C	F	0	0	0	0	0	0	0	0	0	-	-	-	-
16	Smallpox.....	27	C	M	++	++	++	++	++	++	++	++	++	++	++	-	-
17	Smallpox.....	32	W	M	++	++	++	++	+	+	+	++	++	+	++	++	-
18	Chicken pox.....	4	W	M	-	-	-	-	-	-	-	±	-	+	-	-	-
19	Chicken pox.....	10	W	M	-	-	-	-	-	-	-	-	-	-	-	-	-
20	Chicken pox.....	5	W	M	-	-	-	+	-	-	-	±	-	±	-	-	-
21	Chicken pox.....	6	W	M	-	-	-	-	-	-	-	-	-	-	-	-	-
22	Vaccinia-human .	7	W	F	++	++	+	+	+	+	++	++	+	++	++	+	-
23	Chicken pox.....	7	W	F	+	+	-	++	++	-	++	+	-	++	++	+	-
24	Chicken pox.....	7	W	F	++	+	-	-	-	-	-	-	-	-	-	-	-
25	Chicken pox.....	6	W	F	-	-	-	-	-	-	-	-	-	-	-	-	-
26	Chicken pox.....	7	W	M	-	-	-	-	-	-	-	-	-	-	-	-	-
27	Chicken pox.....	8	W	F	-	-	-	-	-	-	-	-	-	-	-	-	-
28	Chicken pox.....	8	W	M	0	0	0	-	-	-	-	-	-	-	-	-	-
29	Chicken pox.....	7	W	F	0	0	0	-	-	-	-	-	-	++	++	++	-
30	Chicken pox.....	7	W	F	0	0	0	-	-	-	-	-	-	++	++	++	-
31	Chicken pox.....	1	W	M	0	0	0	-	-	-	-	-	-	++	++	+	-
32	Chicken pox.....	10	W	M	-	-	-	-	-	-	-	-	-	++	++	-	-
33	Smallpox.....	52	W	F	++	++	++	++	++	++	++	++	++	++	+	-	-
34	Smallpox.....	37	W	F	++	++	++	++	++	++	++	++	++	++	+	-	-
35	Smallpox.....	41	W	F	++	++	++	++	++	++	++	++	++	++	+	-	-
36	Smallpox.....	44	W	M	++	++	++	++	++	++	++	++	++	++	++	+	-
37	Smallpox.....	38	W	M	++	++	++	++	++	++	++	++	++	++	++	++	-
38	Smallpox.....	36	W	F	++	++	++	++	++	+	+	+	-	++	++	++	-
39	Chicken pox.....	2	W	F	++	++	++	++	++	++	++	++	++	++	+	±	-
40	Vaccinia-human .	20	W	F	++	++	++	++	++	++	++	++	++	++	+	±	-
41	Vaccinia-human .	25	C	M	++	++	++	++	++	++	++	++	++	++	+	+	-
42	Vaccinia-human .	50	C	M	+++	+++	+++	+++	+++	+++	+++	+++	+++	+++	+	-	-

0 = test not made

- = no visible flocculation

+++ = heavy precipitate; ++ = moderate; + = light but definite; ± = very slight precipitation

preparation of the antigens. Whenever there was sufficient material it was tested against 3 flocculating serums in addition to normal rabbit serum, but in several instances there was sufficient antigen for tests with only 1 or 2 serums. The tests were incubated at 37° C. and read at intervals, the results recorded in Table V being those obtained at the end of 24 hours.

While the series is small, certain facts are apparent. In the first place, 10, or 35 per cent of the tests with chicken pox material, were positive with one or more of the anti-vaccinia serums. That the flocculation which occurred was nonspecific is indicated by its occurrence also in the tubes containing normal serum.

TABLE VI

AGGLUTINATION OF STAPHYLOCOCCI FROM CHICKEN POX SCABS BY RABBIT SERUMS

Culture	Serums										Salt Solution
	N 2	V 1	V 2	V 3	V 4	V 5	V 6	V 7	V 8	V 9	
24-4	32	32	32	—	16	8	32	32	32	32	—
32-1	16	4	16	—	8	8	32	16	16	16	—

N 2 = Serum of normal rabbit. For description of other serums see Tables I and II
 Figures refer to highest dilution of serum in which definite clumping occurred

The tests with smallpox and vaccinia scabs were all strongly positive but in 4 instances (17, 34, 37 and 38) flocculation occurred with normal serum to such an extent as to throw doubt on the specificity. The frequency with which flocculation occurred in normal rabbit serum is in striking contrast to the results obtained with rabbit virus and is apparently contrary to the clear-cut results of the series reported by Burgess, Craigie and Tulloch. The reaction, as a diagnostic procedure, with the technic used, becomes valueless, due to the difficulty of interpreting the results.

Effect of Concomitant Bacteria on Specificity of Result—In view of the presence in rabbit serum of agglutinins for certain staphylococci, it was thought that this might be the cause of the nonspecific flocculation so frequently encountered. To test this possibility, cultures were

TABLE VII

ABSORPTION EXPERIMENTS WITH STAPHYLOCOCCI FROM CHICKEN POX SCABS

Anti-gen	Source	Unabsorbed Serum				Absorbed with 24-4				Absorbed with 32-1				Salt Sol.
		V 4	V 5	V 8	N 2	V 4	V 5	V 8	N 2	V 4	V 5	V 8	N 2	
24 C	Chicken pox scabs. . . .	24	6	—	24	—	6	—	—	—	6	—	—	—
31 C	Chicken pox scabs. . . .	6	0	—	12	—	0	—	6	6	0	—	—	—
32 C	Chicken pox scabs. . . .	12	0	—	6	—	0	—	12	6	0	—	6	—
24-4	Staphylococcus culture from 24 C.	12	6	24	24	—	—	—	6	12	6	12	24	—
32-1	Staphylococcus culture from 32 C.	12	12	24	24	—	—	—	12	—	—	—	—	—
17 S	Smallpox scabs.	24	48	24	24	24	48	24	—	24	48	48	—	—
Brain	Rabbit brain virus. . . .	24	24	24	—	24	24	24	—	24	24	24	—	—
Dermal	Rabbit dermal virus. . .	24	24	24	12	24	24	12	—	24	24	48	—	—

N 2 = Serum of normal rabbit. For serums Nos. 4, 5 and 8 see Tables I and II
 Figures refer to highest dilution of serum in which definite flocculation occurred
 — = no precipitation in dilution 1:6
 0 = not tested

made from suspensions of several smallpox and chicken pox scabs and representative staphylococci isolated were tested with the rabbit serums which we have used. The results with 2 strains which were most universally agglutinated are given in Table VI. All but one of the serums agglutinated these 2 cultures (24-4 and 32-1), some in comparatively high titer.

Table VII summarizes the results obtained when three anti-vaccinia serums and one normal rabbit serum were absorbed with suspensions of chicken pox scabs and with cultures of staphylococci isolated from them. It is seen that when the serums were so absorbed the titer for the homologous culture and suspension was reduced, while the flocculating properties for a smallpox antigen (17 S) and for vaccinia virus were not affected.

Effect of Incubation Time on Specific Flocculation—The results of the tests presented in Table V are the readings obtained after 24 hours' incubation. It was noted that frequently flocculation had occurred after only 1 or 2 hours in the water bath, particularly in the lower dilutions of serum. In Table VIII are presented the results obtained after different incubation periods with 16 antigens and 3 immune

TABLE VIII

RATE OF FLOCCULATION OF DIFFERENT ANTIGENS

Antigen	1 hr.				2 hr.				4 hr.				18 hr.			
	Serum				Serum				Serum				Serum			
	4	6	8	N	4	6	8	N	4	6	8	N	4	6	8	N
Rabbit dermal.....	—	—	16	—	8	16	16	—	16	32	32	—	16	32	32	—
Brain 2.....	16	—	—	—	16	—	8	—	16	—	16	—	64	16	64	—
Brain 4.....	0	8	16	—	0	32	32	—	0	32	32	—	0	32	64	—
22 V.....	—	—	—	—	—	—	—	—	—	—	—	—	32	16	32	—
17 S.....	8	16	—	—	32	16	16	—	32	16	16	—	32	32	32	—
33 S.....	8	0	8	—	16	0	16	—	32	0	32	—	32	0	64	—
34 S.....	—	0	8	—	—	0	16	—	—	0	16	8	32	0	32	16
35 S.....	—	—	—	—	—	—	—	—	—	—	—	—	32	32	32	8
37 S.....	8	16	16	—	16	32	32	16	16	32	32	16	32	32	64	32
38 S.....	8	16	16	8	8	32	16	16	32	32	32	16	32	32	64	32
23 C.....	—	0	—	—	8	0	—	—	16	0	—	—	16	0	32	16
32 C.....	—	0	—	—	8	0	8	8	16	0	16	16	16	0	32	16
39 C.....	—	—	—	—	—	—	—	8	8	8	8	16	32	32	16	32
40 V.....	—	—	—	—	8	—	8	8	32	16	32	8	32	32	32	16
41 V.....	—	—	—	—	8	8	8	8	16	16	16	8	64	64	64	16
42 V.....	8	8	8	—	32	32	32	8	32	32	32	8	64	64	64	16

Figures refer to highest dilution of serum in which flocculation was apparent

0 = test not made

For sources of antigens see Table V

For description of serums see Tables I and II. N = normal rabbit serum

serums. After incubation for 1 hour, flocculation had occurred in one or more tubes with at least 1 immune serum in the case of 9 vaccinia and smallpox antigens, while no flocculation had appeared with 4 antigens. Only 1 antigen (38S) had flocculated in normal rabbit serum and this was in the first dilution only (1:8). None of the chicken pox antigens flocculated, although they were chosen because of their ability to flocculate well in normal rabbit serum. After 2 hours' incubation all but 2 of the vaccinia and variola antigens had flocculated but 5 had started to flocculate in the normal serum also, and the chicken pox antigens had begun to show precipitation. After 4 hours, the nonspecific flocculation had increased, and after 18 hours only 6 antigens were negative in the normal serum, while the chicken pox suspensions had flocculated in each of the serums tested.

TABLE IX

FLOCCULATION TESTS WITH INCREASING DILUTIONS OF ANTIGENS

Antigen	Source	Dilution of Antigen *											
		1 : 100			1 : 200			1 : 500			1 : 1,000		
		Serum			Serum			Serum			Serum		
		6	8	N	6	8	N	6	8	N	6	8	N
D 3	Rabbit dermal virus, 3d passage.....	32	32	—	32	32	—	32	32	—	32	32	—
B 2	Rabbit brain virus.....	32	64	—	32	32	—	32	32	—	16	8	—
7	Vaccinia—human.....	32	32	—	32	32	—	16	8	—	16	—	—
22	Vaccinia—human.....	32	32	—	32	32	—	16	32	—	8	8	—
40	Vaccinia—human.....	32	64	32	32	64	32	32	64	16	32	64	16
41	Vaccinia—human.....	32	64	16	32	64	16	32	64	16	32	64	8
42	Vaccinia—human.....	32	64	16	32	64	16	32	64	16	32	64	8
9	Smallpox.....	32	32	8	32	32	—	32	8	—	16	8	—
16	Smallpox.....	32	32	16	32	32	8	32	32	—	8	—	—
17	Smallpox.....	32	32	—	32	32	—	32	32	—	16	8	—
33	Smallpox.....	32	32	—	32	32	—	32	32	—	32	32	—
34	Smallpox.....	32	32	8	32	32	8	32	32	—	32	32	—
35	Smallpox.....	32	32	8	32	32	—	32	32	—	32	32	—
37	Smallpox.....	32	64	16	32	32	16	32	32	16	32	32	16
38	Smallpox.....	32	64	16	32	32	16	32	32	16	32	32	16
11	Chicken pox.....	16	16	16	16	16	16	16	16	16	—	—	—
12	Chicken pox.....	16	—	16	16	—	16	—	—	8	—	—	—
13	Chicken pox.....	16	32	32	16	16	16	16	16	16	—	—	8
23	Chicken pox.....	16	16	32	16	16	32	8	—	16	—	—	8
32	Chicken pox.....	—	—	16	—	—	16	—	—	8	—	—	8
39	Chicken pox.....	32	16	32	32	—	16	—	—	16	—	—	8

* Based on turbidity of 1:100 suspension of brain virus

N = Normal rabbit serum

For description of serums 6 and 8 see Tables I and II

Figures refer to highest dilution of serum yielding definite flocculation

Effect of Dilution of Antigen on Specificity—Tests have also been made with increasing dilutions of antigens. Parallel tests with 1:100, 1:200, 1:500 and 1:1,000 dilutions of 15 vaccinia and variola antigens and 6 chicken pox antigens are presented in Table IX. The results are those obtained after 18 hours' incubation at 37° C. It is readily apparent that dilution of the suspensions of chicken pox scabs to 1:1,000 yielded negative results, while the vaccinia and variola antigens still flocculated, most of them as strongly as in lower dilutions. The results with normal rabbit serum were more consistently negative than in the lower dilutions.

Development of Precipitins in Human Serum—Since the vaccinated rabbit responds with the appearance of specific precipitins in its serum, the question arose whether the serum of vaccinated persons also acquired this property. Observations have been made on 4 persons (Table X), never vaccinated before, with the exception of No. 4, who gave a doubtful history of a successful vaccination 20 years ago. In all the vaccination followed a typical course. Specimens of their blood were obtained at the time of vaccination, on the 10th day following, and from 3, on the 17th day. Each serum was set up with a rabbit brain vaccinia suspension (1:200) of which the potency was 1:175,000, and in each instance, also, with a 1:200 suspension of a normal rabbit brain. It is seen that the serum of each individual

TABLE X

PRECIPITIN PRODUCTION IN THE SERUM OF VACCINATED PERSONS

Dilution of Serums	No. 1						No. 2						No. 3						No. 4			
	Day of Vaccination						Day of Vaccination						Day of Vaccination						Day of Vaccination			
	0		10		17		0		10		17		0		10		17		0		10	
	No. 3	N	No. 3	N	No. 3	N	No. 3	N	No. 3	N	No. 3	N	No. 3	N	No. 3	N	No. 3	N	No. 3	N	No. 3	N
8	+	-	++	-	++	±	-	-	+	-	+	-	-	-	++	-	++	+	+	-	++	-
16	-	-	++	-	++	-	-	-	+	-	+	-	-	-	+	-	++	-	-	-	+	-
32	-	-	+	-	++	-	-	-	+	-	+	-	-	-	+	-	+	-	-	-	-	-
64	-	-	-	-	++	-	-	-	-	-	-	-	-	-	-	-	+	-	-	-	-	-
128	-	-	-	-	+	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
256	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Salt sol.	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

No. 3 = Rabbit brain virus. No. 3—1: 200 suspension

N = Normal rabbit brain 1: 200 suspension

Tests read after 4 hours' incubation in water bath at 37° C.

showed, following the vaccination, an increasing titer, from 1:8 or less, to a maximum, on the 17th day, of 1:64, and in 1 case 1:128.

In addition to these observations on the appearance of precipitins following vaccination, the serums of 19 immune persons have been tested for the presence of flocculating properties. All were vaccinated at the time the blood was obtained, with the exception of No. 9, who refused, and No. 22 and No. 23, who were convalescent from smallpox. The results are summarized in Table XI. The serums of 5 persons apparently contained precipitins for normal rabbit brain tissue, 1 (No. 19) yielding a precipitate in 1:16 dilution of the serum, the others in 1:8. Only 3 of the immune persons gave entirely negative results, but since the serum of 1 of the non-immunes (No. 1) flocculated the virus in a dilution of 1:8, it is questionable whether results in such low dilutions are significant. On the other hand, the serum of 1 person (No. 12), who was successfully vaccinated 20 years ago, flocculated in a dilution of 1:64, as high a titer as the serums of the smallpox convalescents. It seems obvious, at least, that a negative flocculation test cannot be taken as an indication of lack of immunity.

DISCUSSION

The experimental evidence obtained is in support of previous observations of other workers who have concluded that vaccinia virus behaves like bacterial antigens in the production of antibodies. It is difficult to explain the clear-cut results with uncontaminated brain antigen in any other way. The experiments in which the agglutinins for concomitant bacteria in dermal virus were absorbed from the serum without affecting its flocculating value for vaccinia virus corroborate this view. Furthermore, the experiments of Maitland and Laing,¹¹ who obtained positive complement fixation with pure cultures of vaccinia virus, can hardly be considered otherwise than as an example of specific antigen—antibody union.

An explanation for the negative results which have been reported may be found, in certain instances at least, in differences of technic. Concentrations of antigen greater than a certain optimum dilution may prevent visible flocculation. While we have in the work reported here held to certain definite dilutions of the antigens, the impression has been gained that, in the case of most antigens, dilution to the point of opalescence, rather than a definite turbidity, yields the most satisfactory results. No exact statement can be made, because the original concentration of virus in the material used can be determined only by animal inoculation.

The ring test, in our experience, does not produce such consistent

results, nor in such high dilutions of serum, as does the flocculation technic. This observation might be interpreted as constituting evidence that the reaction is akin to agglutination rather than precipitation; however, a definite statement is impossible and probably unimportant.

When we come to the application of the reaction as a practical test for the differential diagnosis of smallpox and chicken pox, our experience is discouraging. The occurrence of agglutinins in many rabbit serums for strains of staphylococci found in human chicken pox and variolous material confuses the result, in many cases due to agglutination of these organisms in the normal rabbit serum controls. That Burgess, Craigie and Tulloch encountered the same difficulty in their series is indicated by their statement, "We have on four occasions observed a peculiar reaction to occur when crust extracts have been exposed to rabbit serum, both anti-vaccinia and normal." They claim, however, that the nonspecific reaction which they observed was easily differentiated from the specific precipitation by the size and looseness of the clumps. However this may be, the number of such reactions in our series is apparently larger than theirs and the clumps were sufficiently similar, both in size and character, to the specific clumps, as to make differentiation difficult, if not impossible.

The results obtained in the rather small series where the effect of serial dilutions of the antigens was compared are more encouraging. The observations, though limited in number, indicate that in most cases, at least, at a dilution where the concomitant bacteria fail to give a reaction, the virus is still present in sufficient quantity to cause definite flocculation. Further observations are being made to determine this point.

The results obtained when rabbit neuro-vaccine was tested against human immune serum are entirely analogous to those obtained with immune serum prepared in the rabbit. The results in Table XI indicate that the flocculating properties of the serum do not persist so long as the immunity to the disease, and are therefore not indicative of the immunity status. The vaccinated individuals, whose serum reactions are given in Table X, are being followed to determine how long the reaction persists. The fact that these serums flocculated the virus as early as the 10th day after vaccination, i.e., about the 7th day of the disease, raises the possibility that this early appearance of precipitins may be utilized as a diagnostic aid in the human disease.

SUMMARY

Experimental evidence indicates that the intradermal or intra-

venous inoculation of vaccinia virus in rabbits is followed by the appearance of specific flocculating properties in their serum.

Vaccination of the human subject stimulates the production of precipitins against vaccinia virus. The serum of 4 persons acquired this power to flocculate the virus as early as the 10th day following vaccination.

REFERENCES

1. Gordon, M. H. Studies of the Viruses of Vaccinia and Variola. Med. Res. Council, *Spec. Rep. No. 98*, 1925.
2. Burgess, W. L., Craigie, James, and Tulloch, W. J. Diagnostic Value of Vaccinia Variola Flocculation Test. Med. Res. Council, *Spec. Rep. No. 148*, 1929.
3. Takaki, J., and Koref, O. *Zeitschr. J. Immunität.*, 47: 431, 1926.
4. Ciuca, A. *J. Hyg.*, 28: 325, 1929.
5. Bedson, S. P., and Bland, J. O. W. *Brit. J. Exper. Path.*, 10: 393, 1929.
6. Frobisher, Martin. *Proc. Soc. Exper. Biol. & Med.*, 26: 846, 1929.
7. Schultz, E. W., Bullock, L. T., and Lawrence, F. *J. Immunol.*, 15: 243, 1928.
8. Ward, H. K. *J. Exper. Med.*, 50: 31, 1929.
9. Smith, Wilson. *J. Path. & Bact.*, 33: 273, 1930.
10. Andrewes, C. H. *J. Path. & Bact.*, 33: 265, 1930.
11. Maitland, H. B., and Laing, A. W. *Brit. J. Exper. Path.*, 11: 119, 1930.

Milk Consumption and the Growth of School Children

UNDER the auspices of the Department of Health for Scotland, 10,000 children in the Lanarkshire schools were given $\frac{3}{4}$ pint of raw or pasteurized milk every day from February to June, 1930, and compared with 10,000 other children not so favored.

The result, as in similar but less extensive tests in previous years, showed a definite increase in the rate of growth of the milk-fed group. This increase was the same for raw and pasteurized milk. There was no obvious difference between boys and girls, and little evidence of definite relation between the age of the children and the amount of improvement.

Once again the unsurpassed value of pure milk as the chief contributor to the healthy growth of school children has been demonstrated. Whatever else may be said about the alleged thrift of the Scotch, they have been generous in the nourishment of these children of school age. Their example is worthy of universal emulation.—Gerald Leighton and Peter L. McKinlay, Edinburgh, H. M. Stationery Office, 1930. Abst. James A. Tobey.

Smoke Eradication to Save the Health Value of Urban Sunshine^{*}

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THE loss of the shorter ultra-violet rays of sunshine, due to atmospheric pollution, is beginning to be recognized as a health problem of cities.

That the loss is constant and of sufficient proportions to be of health concern is indicated by recent studies in several American cities. In Chicago, both by spectrographic¹ and chemical methods,² a decided loss of short rays and actinic intensity was shown during most of the year and an unusually long period of low ultra-violet light in sunshine (7 months) was demonstrated. More recent studies in Chicago³ have shown that smoke is a very significant factor in the loss of actinic rays, even in summer, the season of minimum combustion of fuel.

In Baltimore, Shrader, Coblentz, *et al.*⁴ reported a loss of about 50 per cent in solar ultra-violet light as determined by actinic methods.

In New York City, Ives,⁵ in a study of sunshine measured by the photoelectric cell, showed a loss of 50 per cent in visible light, without respect to ultra-violet light.

Efforts to abate the smoke of ordinary fuels to a sufficient degree to save the ultra-violet light of sunshine have thus far proved inadequate. The results have been apparent in greater visibility, cleanliness and economy of fuel rather than in material saving of ultra-violet light.

In Pittsburgh,⁶ an intensive 10-year program of smoke abatement by forced draught combustion methods succeeded in reducing the visible smoke due to unburned tarry matter, but increased the total deposit of dust particles in the air about 40 per cent. Although the dust of ash particles, according to recent experiments,⁷ is somewhat less opaque to ultra-violet light than that of soot and tarry matter, it is nevertheless definitely opaque, and the greatly increased amount of

^{*} Read at a Joint Session of the Public Health Engineering and Industrial Hygiene Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

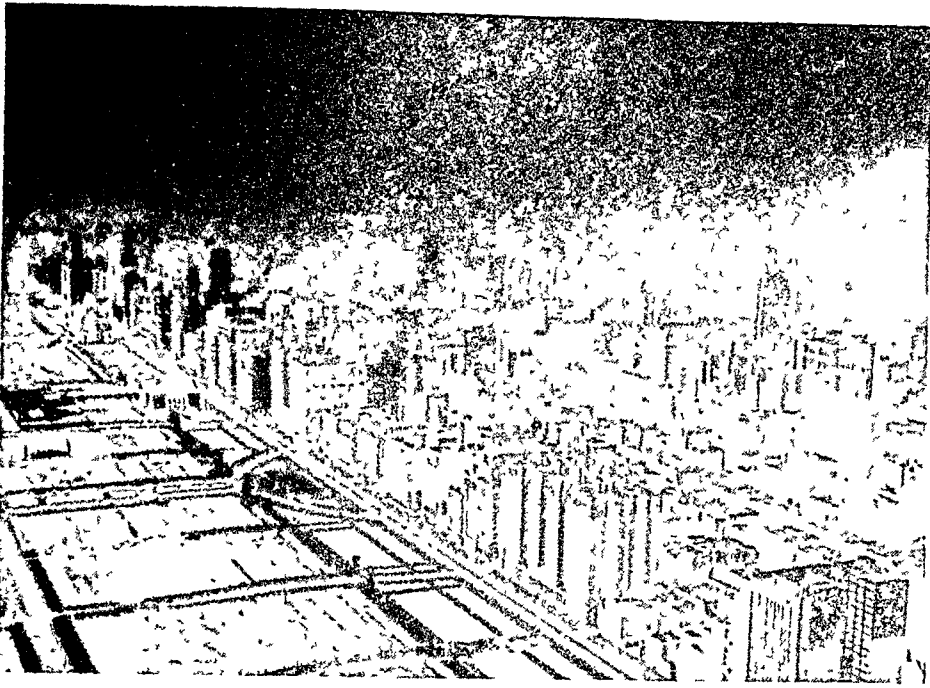


FIGURE I—The smoke problem in Chicago

ash dust would seem to offset the advantage of complete combustion by forced draught.

In Chicago one has only to look out over the downtown district from a loop tower or airplane on a bright summer day to realize the practical futility of control methods applied to the present combustion processes, with respect to conservation of ultra-violet light.

As seen from above, even when combustion is at its minimum, a vast cloud hangs almost continually over the city, the massed contributions of thousands of stacks, each contributing a little, but each for the most part innocent of violation of any sane and reasonable anti-smoke regulation.

It appears therefore that there is little hope of restoring the lost sunshine of cities by smoke control methods applied to the usual combustion processes.

A changed point of view is needed—a new objective to direct engineering thought toward a really effective solution of the problem as a whole, with its health aspects, as well as the esthetic and economic.

That objective, we believe, should be “smoke eradication” rather than “smoke control,” and its motivation should place foremost and above all other considerations the needs of the public health. Its slogan should be: “Sunshine of full actinic value, for urban as well as rural populations. (1) To assure normal growth of children; (2) To build sound, straight teeth and strong bones; (3) To eradicate rickets in infants; and (4) To help maintain resistance to those diseases which attack when vitality is low.”

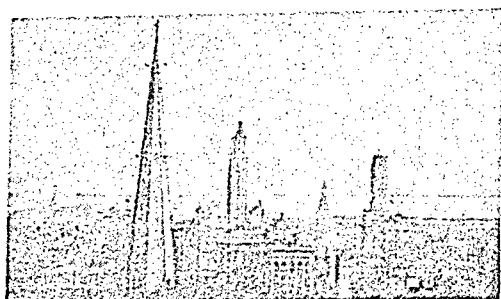


FIGURE II—Two pictures taken at the same time from Foreman Tower: (1) View east toward lake. (2) View west toward Civic Opera Building

Figures III and IV are presented for study and critical analysis, rather than as a basis for any contention or conclusion. They offer data on the relation of (a) total deaths per month, and (b) deaths from acute respiratory disease per month, to (c) the total sunshine hours per month and (d) the erythema hours of sunshine per month, during 1926-1927 in Chicago.

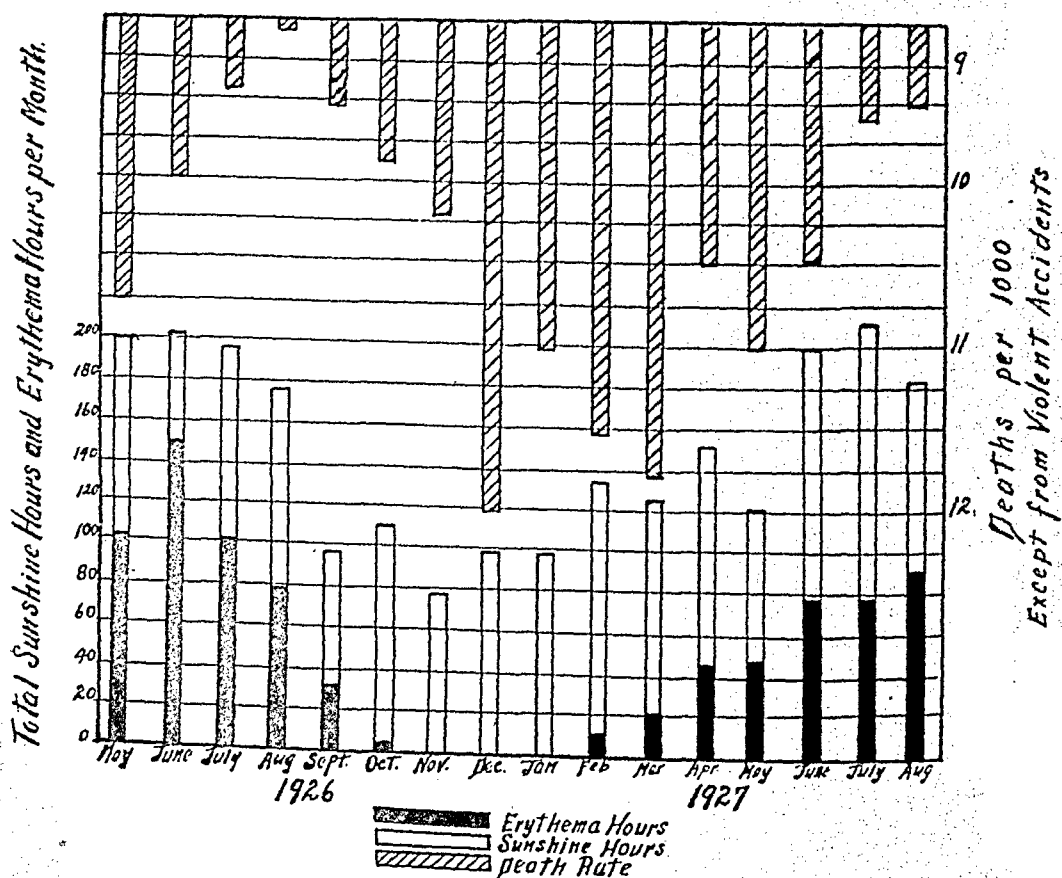


FIGURE III—Relation of total deaths to erythema hours of sunshine per month in Chicago, 1926-1927

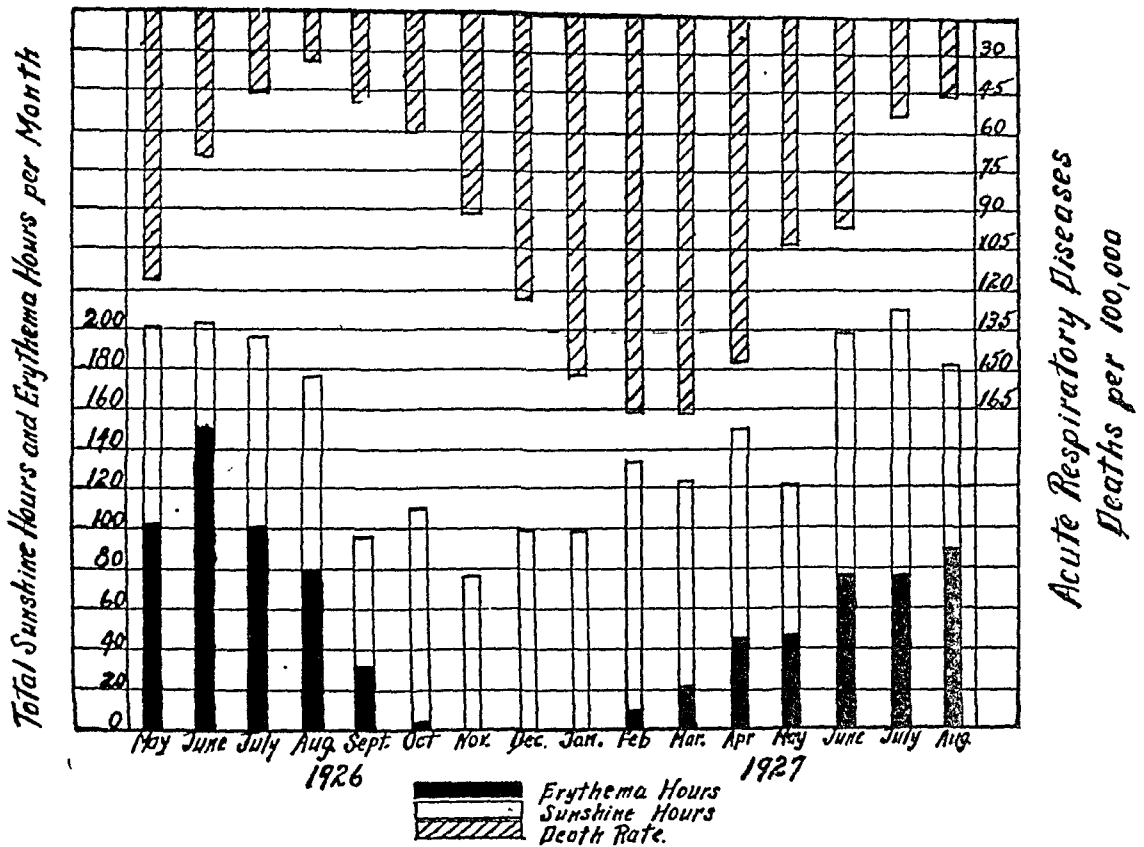


FIGURE IV—Relation of deaths from acute respiratory disease to erythema hours of sunshine per month in Chicago, 1926-1927

The striking feature of these charts is a remarkable correlation between respiratory disease deaths and erythema hours per month, which is not so obvious in any of the other relationships.

Low erythema hours are observed to be followed by high respiratory death rates with a "lag" of 1 to 2 months, and conversely the higher erythema hours per month are followed by correspondingly lower respiratory death rates, after a similar "lag."

THE REMEDY

What promise of really effective smoke eradication may we find in the present state of knowledge to save the sunshine of cities? As a basis for constructive thought and discussion of the practical possibilities, we present 3 suggestions to the engineering profession, which, if they are sound, may help to direct the trend of development.

1. Steam heating from a central plant, serving a large district as a public utility
2. Gas heating
3. Electric heating

THE CENTRAL STEAM HEATING PLANT

The central steam heating plant serving groups of buildings through underground connections is familiar to all, but operating as a "public utility" over a radius of several miles, it is a relatively new development. Such plants appear to be well adapted to congested districts and apparently can compete successfully with individual heating plants, through greater economy in operating costs and larger purchasing power. From the standpoint of smoke abatement, a single stack, representing an efficient and well managed plant, is a welcome substitute for thousands of small plants, many of which are poorly equipped and carelessly operated. Even the minimal smoke accumulation of many small plants inevitably produces a smoke pall, while the same fuel, burned in a single well equipped and competently fired installation, should be relatively innocuous.

"Mariemont," a suburb of Cincinnati, O., illustrates this type of development in a newly built, well planned residence district. The central steam heating plant is now operating in several of the larger American cities, including Cleveland, O., Detroit, Mich., Kansas City, Mo., St. Louis, Mo., Pittsburgh, Pa., and New York, N. Y. Progress toward smoke eradication by this method is necessarily slow and also it seems applicable only under special conditions. However, it deserves consideration as a potential method to be used in combination with the other available methods.

GAS HEATING

The use of both artificial and natural gas in heating and industrial processes is now on the threshold of wide development. Pipe lines are being extended from the natural gas fields to the larger cities, including Chicago. Gas heating appliances may be readily fitted into existing boiler equipment and by reason of automatic control and the elimination of handling, hauling, and storage costs, gas is beginning to compete with other fuels.

Gas combustion is practically complete. The products are gaseous in nature and should contain no ash or other solid particles. Theoretically, at least, the burned effluent of gas combustion should not occlude the ultra-violet light of sunshine. Heretofore, however, there have been no data on this point.

To make a practical test of the possible screening effect upon the actinic light rays of atmospheric accumulations from gas combustion on a large scale, experiments were recently conducted by us in Tulsa and Oklahoma City, Okla., and in Fort Worth and Dallas, Tex., which are essentially gas heated cities. The actinic method was used.²

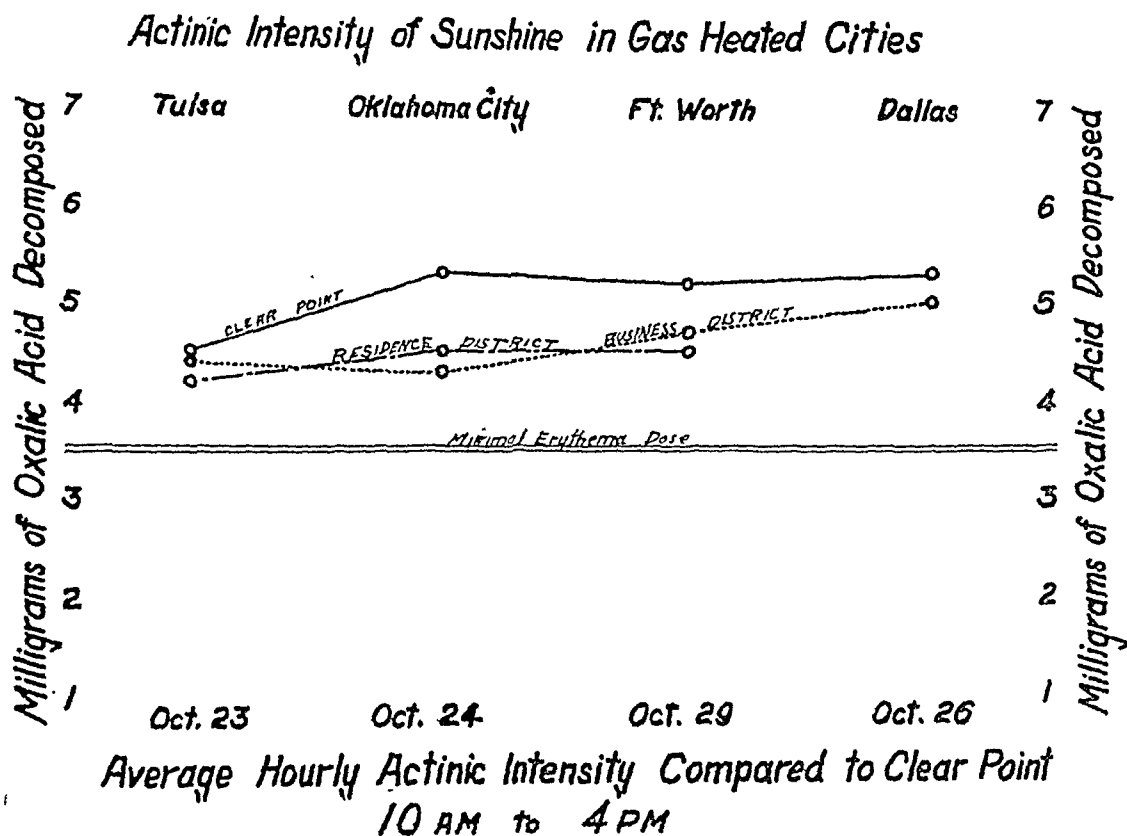


FIGURE V

Figure V shows the average hourly actinic readings between 10 A.M. and 4 P.M. standard time, in the residence and business sections of the 4 cities on clear days, as compared to simultaneous readings in the nearby country, the latter locations being designated as "clear points." The maximum and minimum daily temperatures during the tests ranged from 42–57° F. for Tulsa to 52–76° F. for Dallas.

Figure VI illustrates the hourly differences between the urban and rural readings for a single day in Tulsa, Okla. The noticeable actinic loss between 10 A.M. and 11 A.M. in the residential district was apparently due to coal smoke from locomotives in a railroad yard to the windward. At the next hour the testing station was shifted to the other side of the railroad and thereafter readings closely approximating those of the "clear point" were obtained.

Both charts are to be considered in comparison with Figure VII, representing the similar average findings by months in Chicago, especially from April to August inclusive, the season of minimal combustion for heating purposes.

In the southern cities the proportionate loss of actinic rays of erythema intensity* from the smoke of gas combustion was very

* Actinic intensities of erythema quality are those on or above the line indicating minimal erythema dose.

small compared to the loss in Chicago where coal is the principal fuel.

Of the gas heated cities, Oklahoma City showed the greatest actinic loss with an estimated percentage of about 80 per cent of buildings heated by gas as compared to about 90 per cent for Fort Worth, and 95 per cent for the other 2 cities. The other fuel used is principally oil, but considerable coal is still being burned in Oklahoma City.

In Tulsa an opportunity was presented to test an oil burning district (Figure VI) and here a greater loss of actinic sunshine was demonstrated.

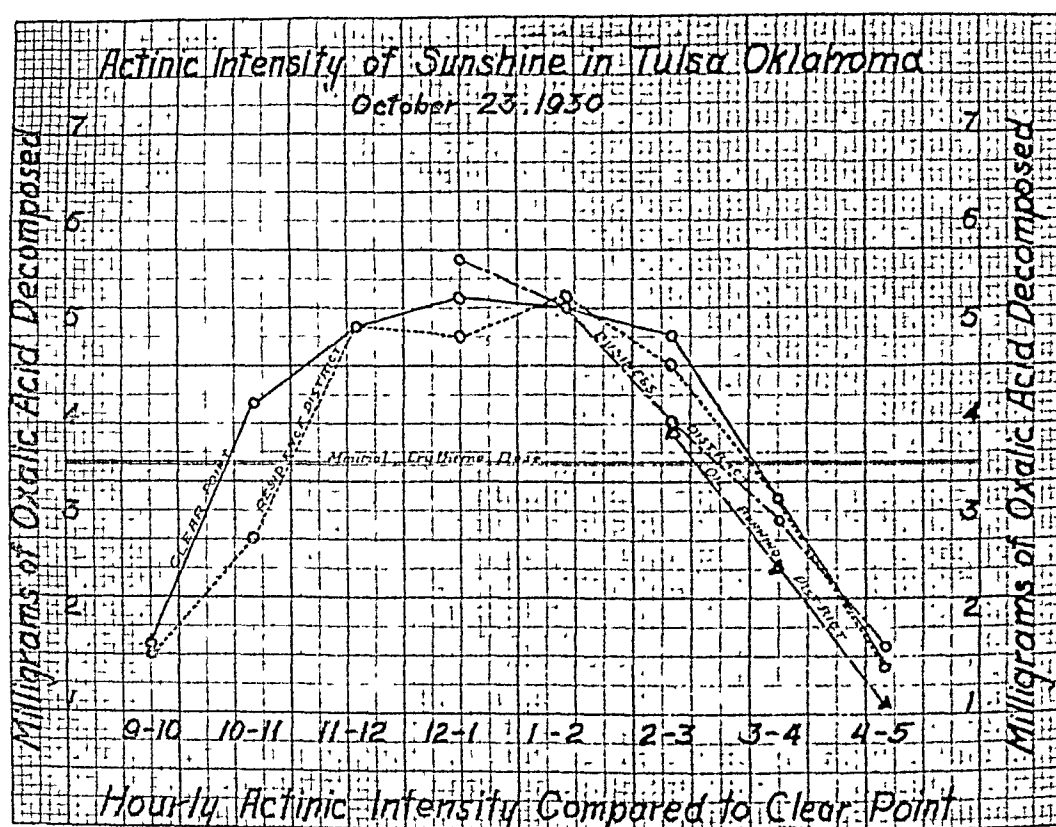


FIGURE VI

From the standpoint of smoke eradication, gas heating appears to offer greater promise of early relief than any of the other methods. It requires no revolutionary changes in building construction or heating equipment. It is equally applicable to old and new heating appliances. It can be placed in small and large plants alike. It may be extended rapidly, and brought to serve large areas within a relatively short time.

Possibly gas heating may not be the ideal ultimate solution of the smoke problem of cities, but it has the advantage of being already at hand. The possibilities of objectionable effects of accumulated gas-

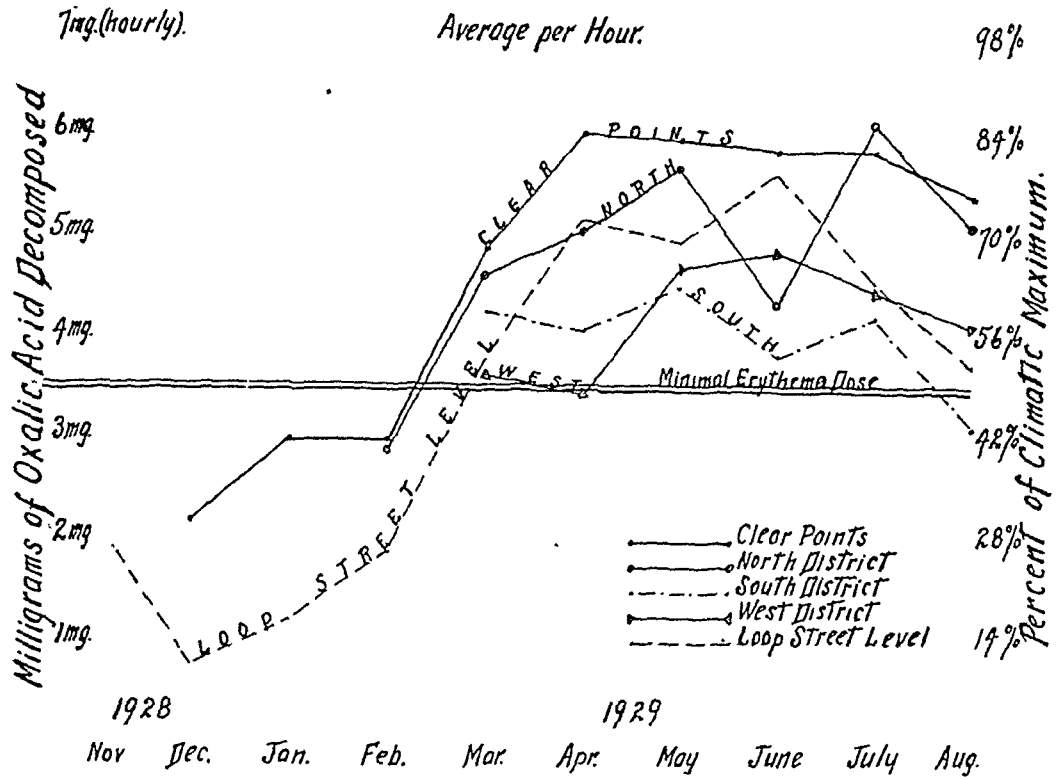


FIGURE VII—Average actinic intensities for four city districts and for clear points. Hourly observations between 11 a.m. and 3 p.m.

ous products of combustion in the atmosphere are yet to be studied, but in any case immediate and decided improvement is certain and a means is available of bridging the gap between the present highly objectionable combustion methods and slowly evolving methods of the future.

A new residential suburb "Sauganash" located in the northwestern section of Chicago is largely a community of gas heated homes. An airplane view of the project is shown in Figure VIII. It will be noted that there is no visible smoke emission from the gas heated homes in the foreground, but many smoke columns are to be seen in the city proper in the background.

ELECTRIC HEATING

Until recently, the prospect of electric heating as the ideal goal of heating methods seemed far remote and to be thought of only for our children's sake. The idea is highly attractive—cleanliness, convenience, complete absence of smoke; fuel burned at a distance from the city and converted into current; hydroelectric power developed to its maximum possibilities. From a health aspect the picture is perfect, and it appeared to be a trend consistent with previous development of electric light and power.

But the cost, we were advised, is prohibitive. The loss of energy in conversion of electric current into heat is greater than in its conversion to light and power. Coal cannot be burned at the mines unless an abundant water supply is at hand. Current cannot be carried more than 300 miles without excessive loss. "There is not enough potential electric energy available to heat the City of Chicago," we were told.

But who knows what compensatory saving there may be in electric heating, once it is established on an extended scale? Charges for fuel transportation by rail, unloading at the yard, reloading, cartage, repeated handling until it reaches thousands of individual plants, janitors shoveling coal and tending furnace, ashes to be hauled, repairs and maintenance, waste of fuel—smoke—all these leaks are costly. Perhaps in electric heating as in gas heating there would be added saving in quick availability—heat at once when and where needed, and saved at once where not needed—no loss in the building up or dying down of fires. Again perhaps there may be material saving in the "inter



Chicago Aerial Survey Co

FIGURE VIII—Sauganash

peak" usage of current supplied through regular channels for ordinary demands. And this brings us to the most recent offering in electric heating, and *again stirs hope!*

Figure IX shows a house heating plan utilizing electric current at "off peak" hours, 11 P.M. to 6 A.M., to heat a well insulated tank of water under pressure to a temperature of 250° F. Thence during the day hot water or hot air heat is delivered by automatic control throughout the house, and at a current cost aggregating but little more than the usual heating costs of a home!

A community of the better type of homes, electrically heated by this method, is now developing in Fort Wayne, Ind., where rate concessions for "off peak" current have been allowed.

In LaGrange, Ill., a suburb of Chicago, a single electrically heated home knocks at our door, awaiting similar rate concessions to make electric heating an actuality in the metropolitan area. A few years ago, it was a dream. Today electric heating is here. The prospective electrification of rail terminals and suburban roads is in line with the trend toward greater peaks and emphasizes the economic desirability of a market for "off peak" current.

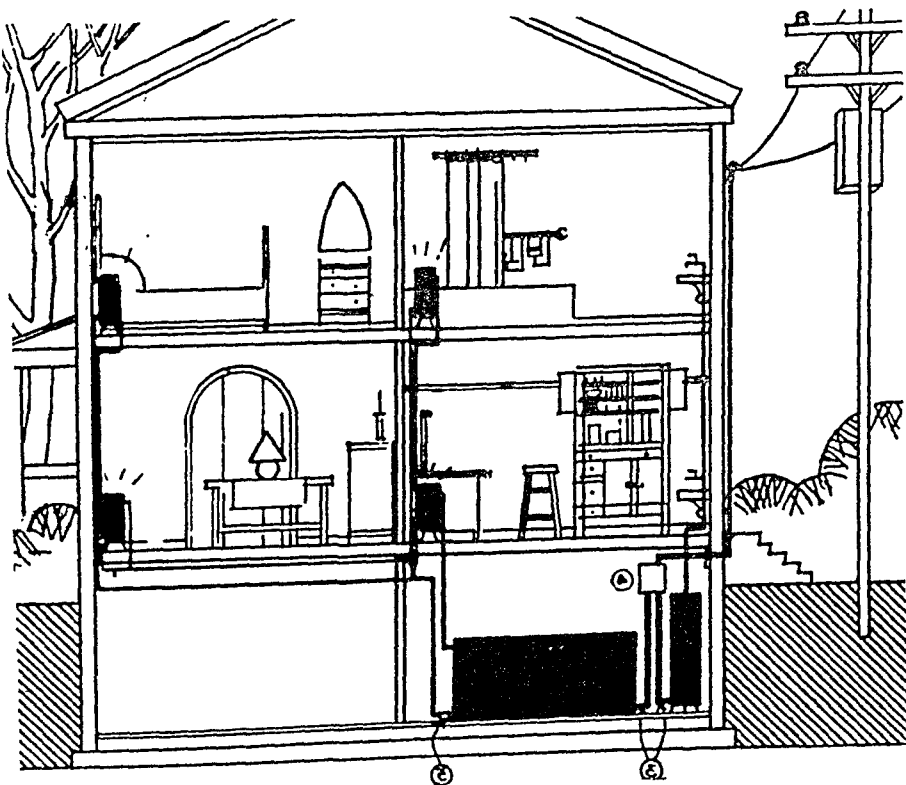


FIGURE IX—Plan of an electrically heated home utilizing "off peak" current

THE FUTURE

What a prospect—electric heating, gas heating and the central steam plant developing hand in hand, each seeking its most favorable outlet, according to its special fitness, electric heat to the finest suburban homes, gas heat to the city proper and to the industries, and central steam heating to the more congested districts. Smoke will be of the past, no longer a menace to health, robbing the children of needed sunshine.

Let us look for a moment toward the city of the future—clean with the cleanliness of health, with clean, invigorating air and undiminished sunshine, white buildings that stay white, clean linens, clean faces.

The health benefits of the country brought to the back yards of the most congested districts: Ruddy complexions like those of vacation days showing adequate dosage of ultra-violet light; healthy, normally growing children with even teeth, straight bones, and a high resistance to disease; a vigorous, active population of workers, producing effectively, living, working, enjoying—in an atmosphere of health.

Some day all this will be a reality. The basic knowledge just now coming to light will force the change, and no one can hold back or block its progress. But we, as health advisers, can speed the change and ourselves participate in its benefits. We can point the way. We can enlighten. We can fight for our convictions, to hasten the transition of the dingy, smoky city of today to the clean and healthful city of tomorrow.

REFERENCES

1. Bundesen, Lemon, Falk, and Coade. *J. A. M. A.*, 89, 3: 187, 1927.
2. (a) Tonney, Somers and Marti. *J. Prev. Med.*, II: 493, 1928.
(b) Tonney and Somers. *A. J. P. H.*, 19: 9 (Sept.), 1929.
3. Tonney, Somers and Hoeft. *J. Prev. Med.*, 4: 2 (Mar.), 1930.
4. Schrader, Coblenz and Kroff. *A. J. P. H.*, 19: 7 (July), 1929.
5. J. E. Ives. U. S. Pub. Health Service, *Bull. No. 197*.
6. Meller, H. B. *Indust. & Eng. Chem.*, 16: 1049, 1924.

Diphtheria in North Carolina, 1920-1930, Inclusive

Year	Number	Rate per 100,000 population	Year	Number	Rate per 100,000 population
1920	286	11.1	1926	263	9.2
1921	365	13.9	1927	278	9.5
1922	510	19.2	1928	355	12.0
1923	331	12.3	1929	324	10.8
1924	323	11.8	1930	253 (Provisional)	7.8
1925	310	11.0			

What of the next few years? The rate for 1930 is lower than before, but 253 deaths is a terrible sacrifice to make to the little dirty gods of Ignorance and Carelessness.—*Health Bull.*, N. C. State Board of Health, Mar., 1931.

Challenge of Malaria in the South *

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ALL studies of the distribution, importance and trends of malaria with which I am familiar have involved consideration of methods for its measurement. No single method of measurement is ideal for use by the ordinary local health organization. Methods which can be employed by the malaria specialist are expensive, and unfortunately there are few real malariologists. As a consequence, accurate and full information is available only for limited areas and for brief periods. Where a systematic collection of all available data has been made, the malaria trends, as based upon personal histories, doctors' records, morbidity records, spleen examinations, blood examinations, and mortality records, are all in general corroborative.

Mortality records of malaria afford the only reasonably complete index available for the entire area of malaria importance. It is known that these records contain inaccuracies and are often misleading. Deaths from malaria contracted elsewhere are recorded in localities in which no transmission of the disease occurs. Again, malaria transmission may be important in a community, impairing the health and working efficiency of the inhabitants without actually causing deaths from the disease. Cities, counties, and other communities, however, which show an appreciable number of deaths of residents from year to year due to malaria can, as a rule, be regarded as having a malaria problem. It should be observed that the total number of deaths occurring in a state where malaria is restricted to a small area may be so few as to suggest that the disease is unimportant, and yet in communities where malaria does occur, it may be the major health problem. Although malaria has rendered many places uninhabitable, it has rarely reached such a degree of severity in this country—certainly this applies to the past decade or two.

In using mortality statistics as a basis for this discussion, it is believed that in spite of the inaccuracies and limitations of the statistics, they do give a true picture of trends over large areas. If a particular city or county were being studied to determine whether malaria consti-

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

tuted a public health problem warranting special administrative procedures against it, and if so, what procedures, the approach would have to be quite different. The focuses of infection and of quadrimaculatus breeding would have to be studied and their relations determined. The type of control measure to be applied in each area would depend on local conditions. In one locality drainage might be practicable, whereas in another screening or other measures would be chosen. Again, a combination of measures would be indicated. Our object here is to give merely a general indication of the nature and scope of the problem in the South.

In former years, when physicians were not so well trained as they are now and when laboratory facilities were not available, the errors of diagnosis must have been greater than at present, but the reporting was less complete. There have been cases where health authorities have found, on investigation, that deaths had been erroneously reported as due to malaria. Dr. Bassett, the health officer of Savannah, Ga., for example, has since 1923 investigated every death ascribed to malaria but in which the parasites had not been found in the blood. He has reported on about 20 autopsies which failed to reveal malaria as the cause of death. Tuberculosis he found to be the usual cause of death in this group, and there were deaths due to pneumonia and cirrhosis of the liver, and one to typhoid fever. Whether the rate of error in the records as to the causes of death is greater for malaria than for other diseases, it is difficult to say, but it is probable that since well trained physicians and diagnostic laboratories are increasing in number, the rate of error is diminishing from year to year. Moreover, the reporting is much more complete. After all, since we have no substitute basis for the general measurement of malaria, we proceed upon the basis of death rates, and I repeat that, as indicators of trends, it is believed that these rates are dependable.

Herewith is presented a series of tables and graphs giving the mortality from malaria by years and states for which it was practicable to collect data. A study of the tables and the corresponding graphs will give a fairly good picture of the malaria trends of the past decade. A few comments on the more significant factors will be given.

MALARIA DEATHS U. S. REGISTRATION AREA, 1910-1928

The graph for the malaria death rates for the United States Registration Area and the supporting figures (Figure I and Table I) are misleading, certainly for the period 1910-1918, because during this period only 9 of the 16 states classed as malarious were in the registration area, and in 1910 out of 16 states incriminated in an article by

TABLE I

MALARIA DEATHS PER 100,000 POPULATION FOR THE REGISTRATION AREA, 1910-1928,
AND FOR NINE SOUTHERN STATES,¹ 1918-1929

Year	Rate for Registration Area	Nine Southern States		
		Population	Deaths	Rate
1910	2.2			
1911	2.4			
1912	2.6			
1913	2.1			
1914	1.9			
1915	1.7			
1916	2.9			
1917	3.0			
1918	2.9	21,131,143	3,634	17.2
1919	3.7	21,342,464	3,463	16.2
1920	3.4	21,553,786	3,453	16.0
1921	3.6	21,915,230	3,648	16.6
1922	3.5	22,276,674	3,134	14.1
1923	2.8	22,638,118	2,394	10.6
1924	2.4	22,999,562	2,023	8.8
1925	2.0	23,361,006	1,936	8.3
1926	1.9	23,722,450	1,833	7.7
1927	2.7	24,083,894	1,976	8.2
1928	3.6	24,445,338	2,510	10.3
1929		24,806,782	2,428	9.8

¹ Alabama, Florida, Louisiana, Mississippi, Missouri, North Carolina, South Carolina, Tennessee, Texas.

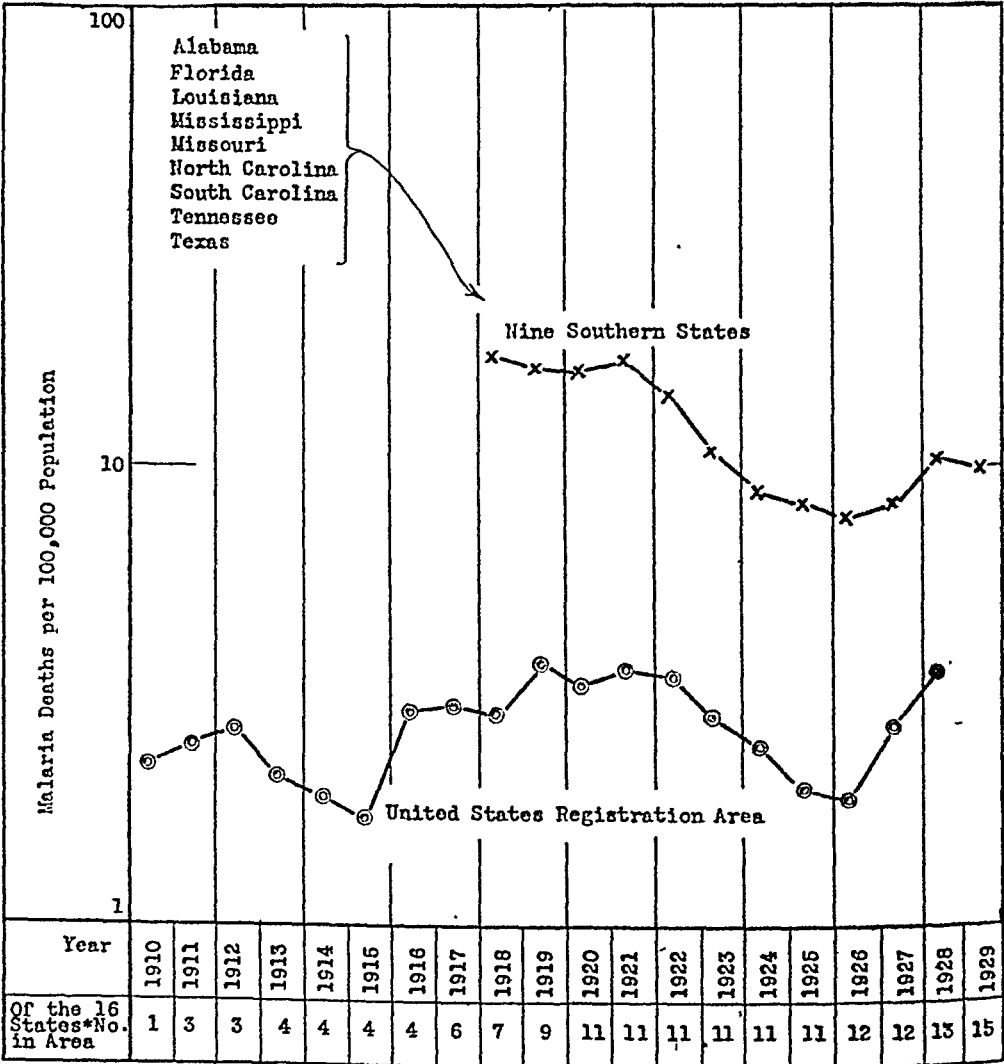
Maxcy, to be referred to later, California was the only one within this area. The graph for 9 states shown also in Figure I is undoubtedly a more correct indication of the malaria trend for the included states. There seems to have been a low point in the mortality curve in 1915. Subsequently either the rate increased yearly up to 1919-1920, or the apparent rise was caused by the addition of malarious states to the registration area. In any case, the 1919-1920 period, whether shown by the registration area graph or by that for the 9 states, was a period of high mortality, and 1925-1926 a period of low mortality. By comparing these graphs with those for the individual states, the degree of similarity of the curves can be observed, as can also the extent to which the curves have risen during the past 3 years.

Before presenting data for the individual states, it would be well to call attention to the excellent article by Maxcy¹ in which he found the case fatality to be about 0.5 per cent. Maxcy arbitrarily designated as malarious all counties which, for a 3-year period, 1919-1921, averaged over 1 death per 10,000 population. A list of the malarious counties by states and the mortality rate for each county are included.

Some of his county figures are quoted in Table V-A. We take the liberty to present his summary as Table I-A to which, for convenience, we have added the columns showing the total number of counties and inhabitants of each state. It will be noted that Maxcy's study incriminated 12,662,256 inhabitants of 520 counties in 16 states, all of which, except California, are in the southern, central, and southeastern part of the United States. The areas involved in some states are quite limited. For example, there were only 4 counties in California, 9 in Illinois, 6 in Kentucky, 11 in Missouri, and 6 in Virginia. Oklahoma had 20, whereas Alabama, North Carolina, South Carolina, and Tennessee had a range from 25 to 30 counties, and the following states had more extensive areas involved: Arkansas 52 counties, Florida 41,

FIGURE I

MALARIA DEATHS PER 100,000 POPULATION FOR THE U. S. REGISTRATION AREA, 1910-1928, AND FOR NINE SOUTHERN STATES,¹ 1918-1929



* K. F. Maxcy's article on Malaria, U. S. P. H. S. Reprint No. 839, May 25, 1923.

Georgia 70, Louisiana 55, Mississippi 74, and Texas 64. The percentage of the population involved ranged from 1 per cent in California, 3 per cent in Virginia, 3 per cent in Illinois, 5 per cent in Kentucky, 6 per cent in Missouri, to 92 per cent in Mississippi, 80 per cent in Florida, 75 per cent in Arkansas and 71 per cent in Louisiana. Reference to Table V-A will show 14 counties for Florida (1927-1929 period), 7 for Alabama (1926-1928 period), and 22 for Georgia (1928), which on the 1 death per 10,000 population basis would be classified as malarious, although not present in Maxcy's list.

Virginia—The malaria of public health importance in Virginia is found in the southeastern counties. Maxcy's study incriminated only

TABLE I-A

THE RELATIVE IMPORTANCE AND INTENSITY OF THE MALARIA PROBLEM IN CERTAIN STATES COMPARED, USING FOR COMPARISON ONLY THOSE COUNTIES HAVING FOR THE 3-YEAR PERIOD 1919-1921 AN AVERAGE DEATH RATE FROM THIS DISEASE OF OVER 1 PER 10,000 POPULATION (Taken from Maxcy's article, U. S. P. H. S. Reprint No. 839—May 25, 1923)

State	Total number of counties ¹	Total 1920 population ¹	Counties involved		Population involved		Deaths from malaria, 1919-1921	
			Number	Per cent of total	Number	Per cent of total	Average annual number	Average annual rate per 10,000 ²
			(a)	(b)	(c)	(d)	(e)	(f)
Alabama	67	2,348,174	29	43	864,408	37	155	1.80
Arkansas	75	1,752,204	52	69	1,321,402	75	639	4.84
California	58	3,426,861	4	7	37,341	1	9	2.41
Florida	67	968,470	41	76	771,304	80	329	4.27
Georgia	161	2,895,832	70	45	1,386,124	48	400	2.89
Illinois	102	6,485,280	9	9	183,496	3	37	2.02
Kentucky	120	2,416,630	6	5	119,192	5	29	2.43
Louisiana	64	1,798,509	55	86	1,285,524	71	486	3.78
Mississippi	82	1,790,618	74	90	1,645,716	92	763	4.64
Missouri	114	3,404,055	11	10	218,397	6	99	4.53
North Carolina	100	2,559,123	26	26	609,241	24	150	2.46
Oklahoma	77	2,028,283	20	26	638,023	31	145	2.27
South Carolina	46	1,683,724	26	57	894,142	53	233	2.61
Tennessee	95	2,337,885	27	28	773,811	33	168	2.11
Texas	254	4,663,228	64	25	1,839,780	39	348	1.90
Virginia	100	2,309,187	6	6	74,355	3	13	1.75
Total ¹	1,582	42,868,063	520	33	12,662,256	30	4,003	3.16

¹ Added to Maxcy's table.

² The average annual number of deaths occurring in those counties (in each state) which have an average rate of more than 1 per 10,000 (column (e)) and the total population of these counties according to the 1920 census (column (c)) are the figures on which the death rates (column (f)) are computed.

TABLE II

MALARIA DEATHS PER 100,000 POPULATION FOR TEN SOUTHEASTERN COUNTIES¹,
IN VIRGINIA AND FOR THE STATE AS A WHOLE²

Year	State as a whole			Ten southeastern counties ³		
	Population	Deaths	Rate	Population	Deaths	Rate
1918	2,259,672	81	3.7			
1919	2,284,429	69	3.0			
1920	2,309,187	51	2.2			
1921	2,320,215	43	1.9	237,127	12	5.1
1922	2,331,243	41	1.8	236,835	22	9.3
1923	2,342,271	45	1.9	236,541	18	7.6
1924	2,353,299	35	1.5	236,249	13	5.5
1925	2,364,327	45	1.9	235,955	14	5.9
1926	2,375,355	25	1.1	235,663	8	3.4
1927	2,386,383	23	1.0	235,369	4	1.7
1928	2,397,411	13	0.5	235,077	2	0.9
1929	2,408,439	16	0.7	234,783	6	2.5

¹ Number of deaths submitted by Dr. Grant, Director of Malaria Control, Virginia State Department of Health.

² Number of deaths submitted by the State Department of Health.

³ The counties are as follows: Accomac, Brunswick, Greensville, Henrico, Isle of Wight, Nansemond, Norfolk, Northampton, Princess Anne, and Southampton.

6 counties (6 per cent) and an area embracing only 74,355 inhabitants, or 3 per cent of the total population. The average number of malaria deaths annually he gave as 13. The mortality figures for the state since 1910 and for 10 southeastern counties since 1921 are given in Tables II and III and are graphically presented in Figures II and III. It will be noted that up to 1928 the mortality curve was downward, but that it went up sharply in 1929. It is singular that the low point occurred 2 years later than the low for the 9 southern states combined (Figure I).

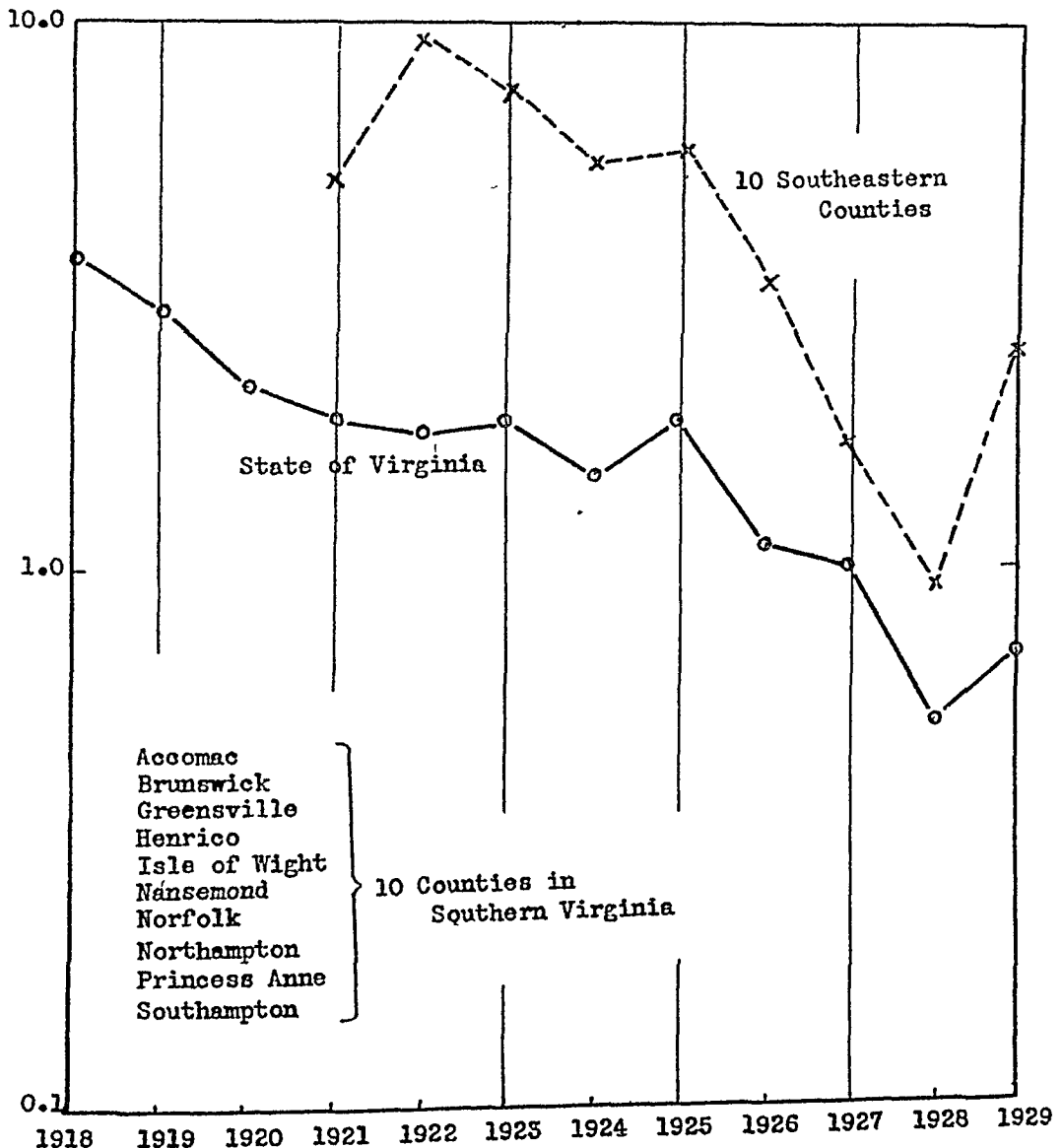
North Carolina—The character of the malaria problem in North Carolina is suggested by Table IV and Figure IV. All 26 of the counties (26 per cent) classed as malarious are located in the eastern part of the state in the tidewater belt. About 24 per cent of the population of the state live in these counties. The graphs for the central or Piedmont area and that for the western or mountain area indicate that, except for the eastern section, malaria is not a serious public health problem. By reference to Figure III and the supporting Table III the extent of the disease in this state may be compared with that found in 5 other states. The position as to the mortality curve is intermediate between Virginia and South Carolina. This is true also as to the extent of the area involved and as to the rate of mortality in the groups of counties where the disease is important. For the state the mor-

tality curve dropped steadily from 1918 to 1927. In 1928 and 1929 the rise was perceptible but very slight. The low point occurred a year earlier than in Virginia and 2 years later than in South Carolina.

South Carolina—The mortality record for malaria in South Carolina is interesting. It will be noted from Table I-A that 26 eastern counties (57 per cent), embracing a population of 894,142, or 53 per cent, had an average of 233 malaria deaths yearly during the 1919-1921 period. The area involves approximately the eastern three-fifths of the state for the period mentioned. Figure III and Table III show that the mortality rose through 1922, then dropped sharply for 3

FIGURE II

MALARIA DEATHS PER 100,000 POPULATION FOR TEN SOUTHEASTERN COUNTIES¹
IN VIRGINIA AND FOR THE STATE AS A WHOLE²



¹ Number of deaths submitted by Dr. Grant, Director of Malaria Control, Virginia State Department of Health.

² Number of deaths submitted by the State Department of Health.

TABLE III

MALARIA DEATHS PER 100,000 POPULATION FOR SIX SOUTHERN STATES,¹ 1918-1929

Year	Kentucky			Tennessee			Mississippi		
	Population	Deaths	Rate	Population	Deaths	Rate	Population	Deaths	Rate
1918	2,391,285	109	4.7	2,307,269	312	14.0	1,791,914	791	44.1
1919	2,403,957	73	3.0	2,322,579	256	10.3	1,791,264	653	36.5
1920	2,416,630	60	2.5	2,337,885	183	7.8	1,790,618	722	38.2
1921	2,437,334	84	3.4	2,364,972	360	15.2	1,812,354	963	53.1
1922	2,458,038	62	2.5	2,392,059	290	12.1	1,834,090	720	39.3
1923	2,478,742	46	1.9	2,419,416	215	8.9	1,855,826	581	31.3
1924	2,499,446	36	1.4	2,446,233	171	7.0	1,877,562	365	19.4
1925	2,520,150	43	1.7	2,473,320	155	6.3	1,899,298	411	21.6
1926	2,540,854	57	2.2	2,500,407	156	6.2	1,921,034	409	21.3
1927	2,561,558	55	2.1	2,527,494	156	6.2	1,942,770	487	25.1
1928	2,582,262	56	2.2	2,554,581	213	8.3	1,964,506	553	28.1
1929	2,602,966	43	1.7	2,581,668	179	6.9	1,986,242	316	15.9

Year	Virginia			North Carolina			South Carolina		
	Population	Deaths	Rate	Population	Deaths	Rate	Population	Deaths	Rate
1918	2,259,672	81	3.7	2,488,555	189	7.6	1,650,060	526	31.9
1919	2,284,429	69	3.0	2,523,838	201	7.9	1,666,892	531	31.9
1920	2,309,187	51	2.2	2,559,123	210	8.1	1,683,724	487	28.8
1921	2,320,215	43	1.9	2,620,239	180	6.9	1,688,608	477	28.2
1922	2,331,243	41	1.8	2,681,355	185	6.8	1,693,492	503	29.7
1923	2,342,271	45	1.9	2,742,471	169	6.2	1,698,376	269	15.8
1924	2,353,299	35	1.5	2,803,587	145	5.2	1,703,260	272	16.0
1925	2,364,327	45	1.9	2,864,703	141	4.9	1,708,144	183	10.7
1926	2,375,355	25	1.1	2,925,819	102	3.5	1,713,028	220	12.8
1927	2,386,383	23	1.0	2,986,935	60	2.0	1,717,912	282	16.4
1928	2,397,411	13	0.5	3,048,051	64	2.1	1,722,796	382	22.2
1929	2,408,439	16	0.7	3,109,167	66	2.1	1,727,680	372	21.5

¹ Number of deaths submitted by the State Departments of Health.

years to 1925. During the succeeding 3 years there was a sharp and continuous rise, and a slight drop in 1929. The 1922 rate was 29.7, the 1925 rate 10.7, and the 1928 rate 22.2, a rise much greater than occurred in North Carolina or Virginia, but similar to that observed in Florida and Alabama. Dr. J. A. Hayne, State Health Officer, expressed the opinion that 1930 will show another rise.

Georgia—The mortality curve for the state (Figure IV-A) reached a high point (20.2) in 1922. During the next 3 years it dropped to 9.8 in 1925, where it remained to 1927; 1928 and 1929 showed marked increases. The curve of the rainfall throughout this period corresponds very closely with the mortality curve, the only discrepancy

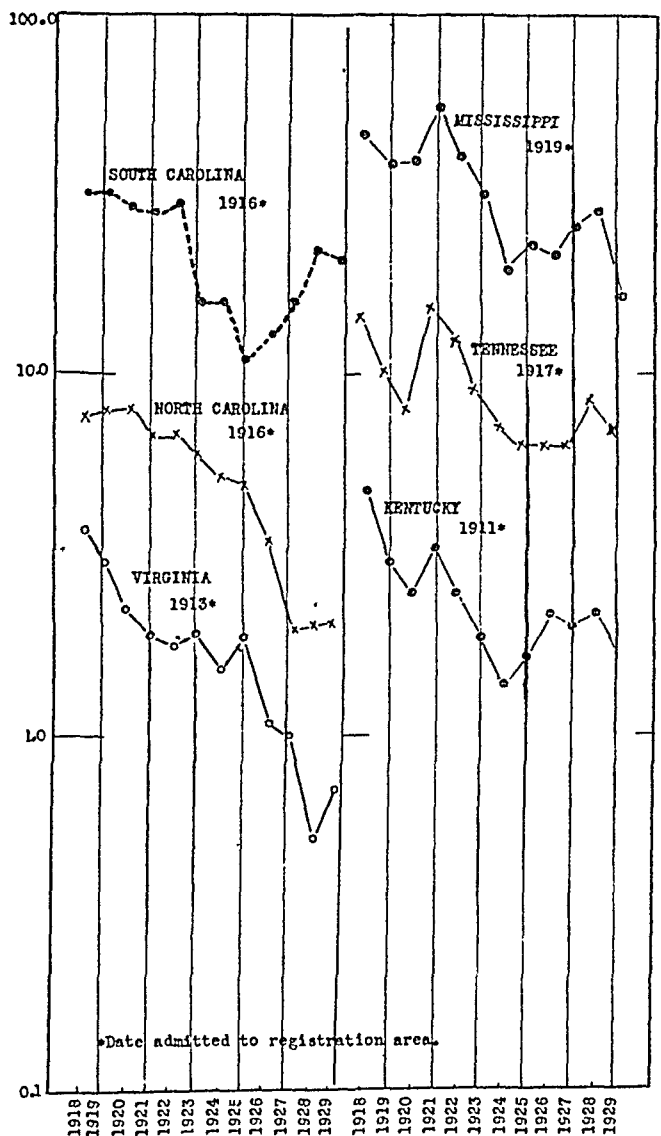
being that the former was higher than the latter for 1926 (Figure IV-A). The mortality record for 1928 in 69 counties is compared in Table V-A with the mortality of these counties as reported by Maxcy for 1921. The 1928 list shows 22 counties which in the 1921 record were not included in the malarious class. The comparison of the mortality rate by counties in this table is interesting in that it shows by counties the fluctuation in the mortality rates. This, of course, is to be expected where small population groups are considered. According to Dr. T. F. Abercrombie, the State Health Officer, available data suggest that the mortality rate for 1930 for the state will be somewhat lower than for the previous year.

Florida—The malaria problem in Florida is extensive, severe, and difficult. Three-fourths of the counties, embracing 80 per cent of the population, are malarious. From a rate of 43.6 in 1919 for the state, there was a fluctuating reduction to 16.1 in 1927, with a sharp trend upward in 1928 and 1929 to 33.2 (Table V and Figure V). Table V-A compares the malaria rates for 41 counties incriminated by Maxcy for the 1919–1921 period with the 1927–1929 period and shows high rates for both periods, although in 25 of the counties the rates were lower in the later period.

Alabama—The malaria mortality record in Alabama is reflected in Table V and Figure V. In 1918 the state mortality rate was 16.3 and in 1929, 16.4. The curve from 1918 was generally downward

FIGURE III

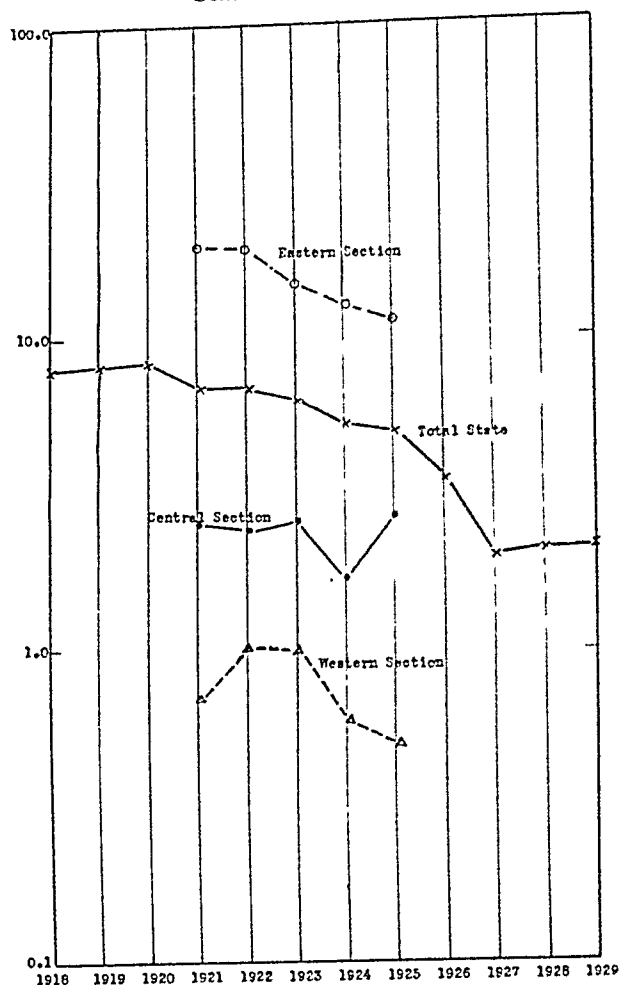
MALARIA DEATHS PER 100,000 POPULATION FOR SIX SOUTHERN STATES,¹ 1918–1929



¹ Number of deaths submitted by the State Departments of Health.

FIGURE IV

MALARIA DEATHS PER 100,000 POPULATION FOR THREE SECTIONS OF NORTH CAROLINA AND FOR THE STATE AS A WHOLE¹



¹ Figures submitted by State Department of Health, North Carolina.

until 1927 when the rate was 8.0. Of the 67 counties in the state, 29, or 43 per cent, including 37 per cent of the state population, were classed as malarious (Table I-A). Nineteen twenty-eight and 1929 were years of heavy precipitation and floods. Of the 29 counties which in 1919-1921 had over 10 deaths per 100,000 population, 18 continued to exceed this rate in the 1926-1928 period, and 7 other counties had increases which placed them in the malarious group, making a total of 25. The mortality curve for Florida for the past 8 years corresponds closely with those of South Carolina and Alabama and in all there were sharp rises in 1927 and 1928 with years of heavy rainfall in spring and summer.

Mississippi—Mississippi has had, and through 1928 continued to have, a serious malaria problem. In the 1919-1921 period (Table I-A) 90 per cent of the counties and 92 per cent of the population were in areas showing 10 or more deaths per 100,000 inhabitants. Figure III shows the state mortality curve and also compares the extent of its problem with that of 5 other states, 3 of them in the Mississippi River basin. In comparison with the curves shown for Tennessee and Kentucky, the Mississippi curve is high. Dr. Mark F. Boyd and his associates in the Mississippi State Board of Health have subdivided the 82 counties of the state into 5 groups and shown the malaria mortality rates and trends for each during the period 1914-1928 both for white and colored population (Tables VI and VII, and Figures VI and VII). For the state as a whole, 1921 was the record year for deaths, when the

TABLE IV

MALARIA DEATHS PER 100,000 POPULATION FOR THREE SECTIONS OF NORTH CAROLINA
AND FOR THE STATE AS A WHOLE ¹

Year	State as a whole			Eastern Section		Central Section		Western Section	
	Population	Deaths	Rate	Deaths	Rate	Deaths	Rate	Deaths	Rate
1918	2,488,555	189	7.6						
1919	2,523,838	201	7.9						
1920	2,559,123	210	8.1						
1921	2,620,239	180	6.9	137	18.5	29	2.5	6	0.7
1922	2,681,355	183	6.8	141	18.8	28	2.4	8	1.0
1923	2,742,471	169	6.2	112	14.7	31	2.6	8	1.0
1924	2,803,587	145	5.2	97	12.6	21	1.7	5	0.6
1925	2,864,703	141	4.9	86	11.1	33	2.7	4	0.5
1926	2,925,819	102	3.5						
1927	2,986,935	60	2.0						
1928	3,048,051	64	2.1						
1929	3,109,167	66	2.1						

¹ Figures submitted by State Department of Health, North Carolina.

rate was 53.1. The mortality curve then fell sharply to 19.4 in 1924. Thereupon it rose steadily for 4 years till it reached 28.1 in 1928. In 1929 there was a sharp drop which Dr. Boyd thinks has become even sharper in 1930, owing to the exceptional drought.

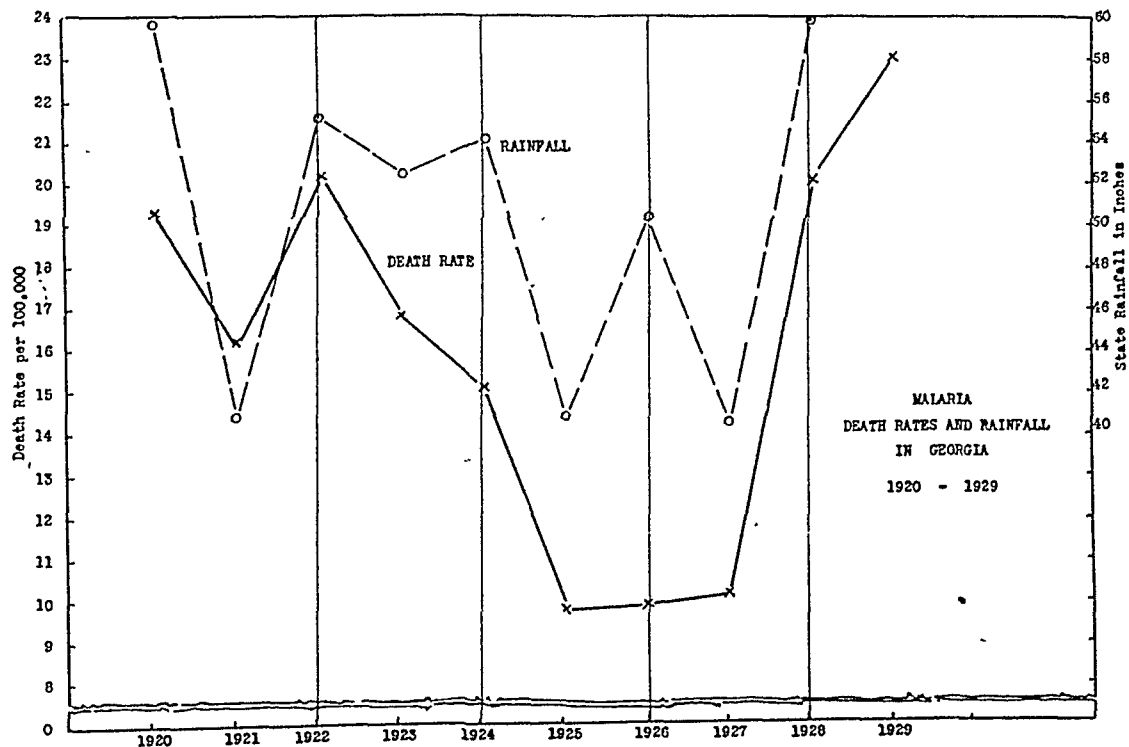


FIGURE IV-A

Tennessee—Malaria in Tennessee is found mainly in the western counties. The graph Figure III shows the trends in the death rates for the state as a whole for the period 1918–1929. The year 1921 was the high point in the mortality curve, when the rate was 15.2; and from the low point of 6.3, reached in 1925, there has been no increase to more than 7.0, except in 1928 when it was 8.3.

Kentucky—Kentucky, like Illinois and Tennessee, has only a small part of its area, 5 per cent of the counties and 5 per cent of the population, in the malaria zone. The general trend since 1918 (Figure III and Table III) has progressed downward from a rate of 4.7 to 1.4. The low point was reached in 1924. Except for the 3-year period 1926–1928, when it rose to 2.2, the rate has remained under 2.0.

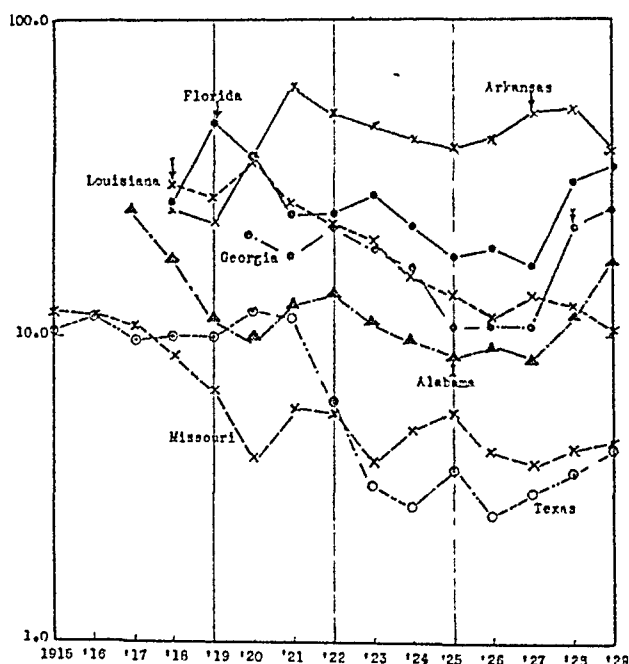


FIGURE V

MALARIA DEATHS PER 100,000 POPULATION FOR SEVEN SOUTHERN STATES

NOTE—Arrow indicates year state was admitted to registration area, with the exception of Missouri, which was admitted 1911. Texas has not yet been admitted.

¹ Number of deaths submitted by the State Departments of Health.

Missouri—The trend of malaria mortality in Missouri for the period 1918–1929 is shown in Figure V. It has not fluctuated widely.

Arkansas—Malaria in Arkansas has been and continues to be a major health problem involving about 69 per cent of the counties in which about 75 per cent of the inhabitants reside. As in other states, the years 1921 and 1928 represent high points in the curve (Figure V), when the rates were 58.3 and 47.8 respectively. The intervening period showed only a slight drop, but that for 1929 is sharper.

Texas—Although Texas is not yet in the registration area, the record of deaths by years is available (Table V and Figure V). There will be noted a relatively high mortality for the 1915–1921 period, then a notable drop for 5 years to 1926, when the rate was 2.6. Since that time the rate has risen gradually but steadily through 1929 to 4.2. In

MALARIA DEATHS PER 100,000 POPULATION FOR SEVEN SOUTHERN STATES¹

Year	Arkansas			Year	Texas		
	Population	Deaths	Rate		Population	Deaths	Rate
				1915	4,279,887	426	10.0
				1916	4,356,556	484	11.1
				1917	4,433,225	413	9.3
1918	1,716,653	404	23.5	1918	4,509,894	428	9.5
1919	1,734,428	367	21.2	1919	4,586,563	436	9.5
1920	1,752,204	610	34.8	1920	4,663,228	528	11.3
1921	1,762,382	1,027	58.3	1921	4,779,032	523	10.9
1922	1,772,560	824	46.5	1922	4,894,836	290	5.9
1923	1,782,738	756	42.4	1923	5,010,640	160	3.2
1924	1,792,916	700	39.0	1924	5,126,444	141	2.8
1925	1,803,094	646	35.8	1925	5,242,248	192	3.7
1926	1,813,272	695	38.3	1926	5,358,052	139	2.6
1927	1,823,450	844	46.3	1927	5,473,856	170	3.1
1928	1,833,628	876	47.8	1928	5,589,660	204	3.6
1929	1,843,806	667	36.2	1929	5,705,464	238	4.2

Year	Missouri			Alabama		
	Population	Deaths	Rate	Population	Deaths	Rate
1915	3,348,695	388	11.6			
1916	3,359,767	374	11.1			
1917	3,370,839	356	10.6	2,285,149	530	23.2
1918	3,381,911	278	8.2	2,306,157	376	16.3
1919	3,392,983	218	6.4	2,327,165	257	11.0
1920	3,404,055	137	4.0	2,348,174	221	9.4
1921	3,425,746	192	5.6	2,377,886	259	10.9
1922	3,447,437	186	5.4	2,407,598	314	13.0
1923	3,469,128	132	3.8	2,437,310	257	10.5
1924	3,490,819	169	4.8	2,467,022	229	9.3
1925	3,512,510	189	5.4	2,496,734	204	8.2
1926	3,534,201	145	4.1	2,526,446	221	8.7
1927	3,555,892	136	3.8	2,556,158	204	8.0
1928	3,577,583	151	4.2	2,585,870	291	11.3
1929	3,599,274	153	4.3	2,615,582	428	16.4

Year	Florida			Louisiana			Georgia		
	Population	Deaths	Rate	Population	Deaths	Rate	Population	Deaths	Rate
1918	925,299	224	24.2	1,770,084	510	28.8			
1919	946,884	440	43.6	1,784,296	471	26.4			
1920	968,470	352	35.1	1,798,509	613	34.1	2,895,832	559	19.3
1921	1,018,285	231	22.7	1,828,108	463	25.3	2,896,493	468	16.2
1922	1,068,101	247	23.1	1,857,707	401	21.6	2,897,154	584	20.2
1923	1,117,916	293	26.2	1,887,306	318	16.8	2,897,815	489	16.9
1924	1,167,732	249	21.3	1,916,905	282	14.7	2,898,476	440	15.2
1925	1,217,547	209	17.2	1,946,504	252	12.9	2,899,137	285	9.8
1926	1,267,363	230	18.1	1,976,103	211	10.7	2,899,798	288	9.9
1927	1,317,178	212	16.1	2,005,702	269	13.4	2,900,459	296	10.2
1928	1,366,994	401	29.3	2,035,301	251	12.3	2,901,120	582	20.1
1929	1,416,809	470	33.2	2,064,900	206	10.0	2,901,781	667	23.0

¹ Number of deaths submitted by the State Departments of Health.

TABLE V-A

COMPARISON OF MALARIA DEATHS PER 100,000 POPULATION FOR COUNTIES IN FLORIDA, ALABAMA AND GEORGIA FOR PERIODS INDICATED

Florida				Alabama				Georgia			
Counties	1919-1921 ¹ rate	1927-1929 ² rate	+ indicates increase in 1927-1929 rate	Counties	1910-1921 ¹ rate	1926-1928 ³ rate	+ indicates increase in 1926-1928 rate	Counties	1921 ¹ rate	1928 ⁴ rate	+ indicates increase in 1928 rate
Alachua	41.0	26.9	-	Autauga	11.0	9.0	- 2.0	Appling	28.0	0.0	- 28.0
Baker	35.0	16.2	-	Baldwin	15.0	16.3	+ 1.3	Bacon	15.0	14.4	- 0.6
Bay	32.0	25.1	-	Barbour	22.0	10.3	- 11.7	Baker	48.0	12.6	- 35.4
Bradford	24.0	10.0	-	Bibb	13.0	9.8	- 3.2	Bartow	13.0	0.0	- 13.0
Calhoun	57.0	79.0	+	Bulloch	16.0	6.7	- 9.3	Ben Hill	14.0	7.3	- 6.5
Citrus	133.0	91.7	+	Choctaw	19.0	16.4	- 2.6	Berrien	19.0	0.0	- 19.0
Columbia	35.0	41.2	+	Clarke	11.0	39.0	+ 28.0	Bibb	13.0	6.6	- 6.4
De Soto	20.0	8.9	-	Colbert	16.0	16.7	+ 0.7	Bleckley	67.0	116.9	+ 49.9
Duval	12.0	6.1	-	Crenshaw	13.0	8.7	- 4.3	Brooks	33.0	18.2	- 14.8
Escambia	12.0	13.3	+	Dale	13.0	1.2	- 8.8	Bryan	48.0	0.0	- 48.0
Franklin	29.0	32.9	+	Dallas	18.0	12.0	- 6.0	Burke	71.0	118.9	+ 47.9
Gadsden	47.0	91.6	+	Geneva	31.0	32.5	+ 1.5	Calhoun	19.0	66.6	+ 47.6
Hamilton	50.0	52.1	+	Greene	28.0	31.1	+ 3.1	Camden	57.0	61.9	+ 4.9
Hernando	44.0	11.1	-	Hale	33.0	19.1	- 13.6	Candler	11.0	11.1	+ 0.1
Hillsborough	16.0	5.7	-	Henry	19.0	9.1	- 9.9	Charlton	15.0	0.0	- 15.0
Holmes	47.0	54.4	+	Houston	10.0	43.1	+ 33.1	Chatham	20.0	7.7	- 12.3
Jackson	106.0	94.5	+	Lamar	11.0	8.3	- 2.7	Clay	26.0	81.9	+ 55.9
Jefferson	115.0	121.8	+	Lawrence	16.0	12.6	- 3.4	Colquitt	31.0	3.3	- 27.7
Lafayette	176.0	41.9	-	Lawrence	16.0	11.6	- 4.4	Crisp	21.0	62.3	+ 41.3
Lake	39.0	10.0	-	Macon	13.0	19.0	+ 6.0	Dawson	21.0	0.0	- 21.0
Leon	111.0	31.2	-	Marengo	17.0	30.5	+ 13.5	Decatur	19.0	27.7	+ 8.7
Levy	150.0	131.3	+	Monroe	11.0	9.9	- 1.1	Doyle	20.0	32.1	+ 12.1
Liberty	10.0	47.0	+	Montgomery	12.0	21.0	+ 9.0	Early	105.0	70.6	- 34.4
Madison	100.0	151.9	+	Morgan	17.0	8.9	- 8.1	Effingham	60.0	0.0	- 60.0
Manatee	26.0	13.8	-	Perry	16.0	10.6	- 5.4	Emanuel	33.0	1.1	- 30.9
Marion	63.0	63.3	+	Pickens	21.0	27.3	+ 6.3	Floyd	18.0	2.1	- 15.9
Nassau	26.0	10.2	-	Talladega	17.0	9.2	- 7.8	Glenn	71.0	0.0	- 71.0
Okaloosa	21.0	10.3	-	Walker	12.0	6.5	- 5.5	Grady	15.0	5.2	- 9.8
Okeechobee	91.0	53.9	-	Washington	11.0	28.0	+ 17.0	Hardee	13.0	30.9	+ 17.9
Orange	25.0	6.9	-	Butler	12.4	12.4	-	Franklin	16.0	0.0	- 16.0
Palm Beach	16.0	2.2	-	Conceh	10.0	10.0	-	Haralson	11.0	0.0	- 11.0
Polk	23.0	7.6	-	Covington	11.0	11.0	-	Houston	18.0	41.7	+ 23.7
Putnam	20.0	11.7	-	Madison	17.8	17.8	-	Irwin	16.0	32.5	+ 16.5
St. Lucie	13.0	13.9	+	Shelby	17.3	17.3	-	Jefferson	31.0	85.3	+ 54.3
Santa Rosa	15.0	11.3	-	Tuscaloosa	11.2	11.2	-	Jenkins	70.0	130.5	+ 60.5
Sumter	61.0	79.4	+	Wilcox	21.6	21.6	-	Johnson	45.0	31.4	- 13.6
Suwanee	86.0	102.6	+				Jones	15.0	10.2	- 4.8	
Taylor	178.0	125.4	+				Laudens	18.0	29.4	+ 11.4	
Volusia	40.0	111.1	+				Lee	37.0	101.8	+ 64.8	
Washington	17.0	25.1	+				Lowndes	15.0	23.9	+ 8.9	
Wayne	25.0	66.1	+				McIntosh	80.0	17.8	- 62.2	
Wilcox	25.0	11.9	-				Nacogdoches	31.0	11.1	- 20.0	
							Nicholson	27.0	62.5	+ 35.5	
							Monroe	15.0	7.5	- 7.5	
							Nussey	14.0	7.3	- 6.7	
							Ochlocknee	20.0	6.9	- 13.1	
							Pierce	25.0	10.3	- 14.7	
							Polk	15.0	0.0	- 15.0	
							Pulaski	33.0	73.5	+ 40.5	
							Rockdale	11.0	13.0	+ 2.0	
							Randolph	30.0	11.7	- 18.3	
							Richmond	19.0	0.0	- 19.0	
							Schley	19.0	0.0	- 19.0	
							Screven	12.0	81.6	+ 69.6	
							Sumter	51.0	32.9	- 18.1	

¹ Figures taken from Maxey's article U. S. P. H. S. *Report, No. 839*, May 25, 1923.

² The last 14 counties listed had a rate of 10 or more deaths per 100,000 population in 1927-1929.

³ Number of deaths submitted by the Florida State Department of Health.

⁴ The last 7 counties listed show a rate of 10 deaths per 100,000 or higher in 1926-1928.

Figures submitted by Alabama State Department of Health.

* The last 22 counties listed show a rate of 10 deaths per 100,000 or higher in 1929. Number of deaths submitted by Georgia State Department of Health.

* Not listed as a county in 1920.

¹ Figures taken from Maxey's article U. S. P. H. S. *Report, No. 539*, May 23, 1923.² The last 11 counties listed had a rate of 10 or more deaths per 100,000 population in 1927-1929.³ Figures submitted by the Florida State Department of Health.⁴ The last 7 counties listed show a rate of 10 deaths per 100,000 or higher in 1926-1928.⁵ Figures submitted by Alabama State Department of Health.⁶ The last 22 counties listed show a rate of 10 deaths per 100,000 or higher in 1929. Number of deaths submitted by Georgia State Department of Health.⁷ Not listed as a county in 1920.

TABLE VI

MALARIA DEATHS PER 100,000 POPULATION FOR FIVE GROUPS OF COUNTIES
IN MISSISSIPPI,¹ 1914-1928

Year	White Death Rates				
	Delta	Bluff	North Eastern	South Central	Coastal
1914	163.0	65.2	31.3	18.4	13.9
1915	216.0	105.2	53.2	33.7	22.7
1916	153.0	89.5	49.8	52.4	29.3
1917	132.2	62.6	28.2	34.7	11.1
1918	75.8	21.6	24.4	16.9	8.7
1919	83.0	38.1	17.6	16.9	8.6
1920	93.0	40.2	15.5	14.1	2.1
1921	125.5	58.6	31.5	18.6	10.5
1922	124.2	32.8	23.1	10.9	10.3
1923	71.0	25.6	19.7	11.9	51.2
1924	36.3	15.4	11.8	4.1	30.4
1925	48.4	14.4	9.9	5.5	0.0
1926	51.6	19.5	11.6	6.5	1.9
1927	51.2	19.5	12.3	6.5	1.9
1928	73.0	27.6	13.9	7.9	1.9

¹ Figures submitted by Dr. Boyd, Bureau of Malaria Control, Mississippi State Board of Health.

TABLE VII

MALARIA DEATHS PER 100,000 POPULATION IN FIVE GROUPS OF COUNTIES
IN MISSISSIPPI,¹ 1914-1928

Year	Negro Death Rates				
	Delta	Bluff	North Eastern	South Central	Coastal
1914	134.4	79.8	39.2	36.9	27.2
1915	157.2	122.4	69.9	47.1	67.1
1916	139.5	107.5	67.2	68.6	22.9
1917	113.2	66.7	40.0	50.8	47.4
1918	112.7	60.5	34.1	32.1	60.5
1919	84.2	49.6	22.4	28.2	12.6
1920	107.0	61.6	22.1	21.8	19.5
1921	110.5	86.1	42.3	27.7	30.1
1922	84.5	66.8	29.0	16.9	13.9
1923	78.2	45.7	22.2	12.5	14.4
1924	42.4	36.4	21.8	10.9	7.5
1925	58.0	32.0	18.9	15.7	6.9
1926	44.7	43.7	20.6	12.9	0.0
1927	54.0	40.0	15.2	15.5	0.0
1928	55.4	50.8	21.5	18.1	17.7

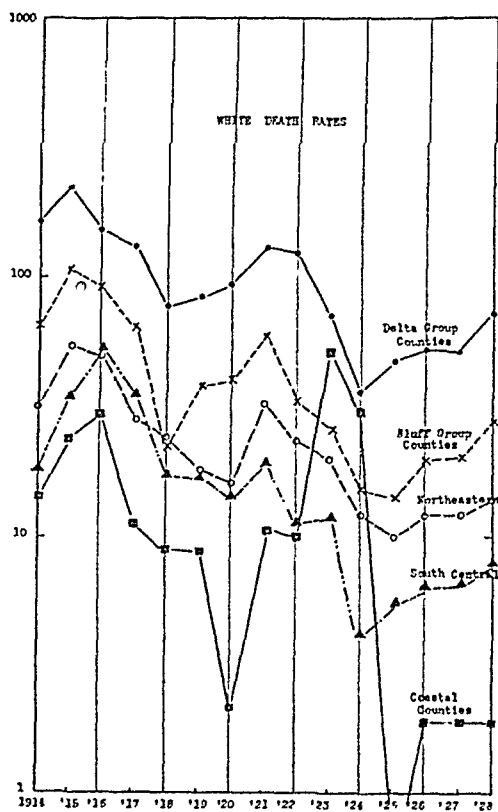
¹ Figures submitted by Dr. Boyd, Bureau of Malaria Control, Mississippi State Board of Health.

comparing the relative position of the various state mortality curves, we should again recall that certain groups of counties in a large state may present intensely malarious conditions while for obvious reasons the rate for the state as a whole will be low.

FIGURE VI

MALARIA DEATHS PER 100,000 POPULATION FOR FIVE GROUPS OF COUNTIES IN MISSISSIPPI,¹ 1914-1928

White

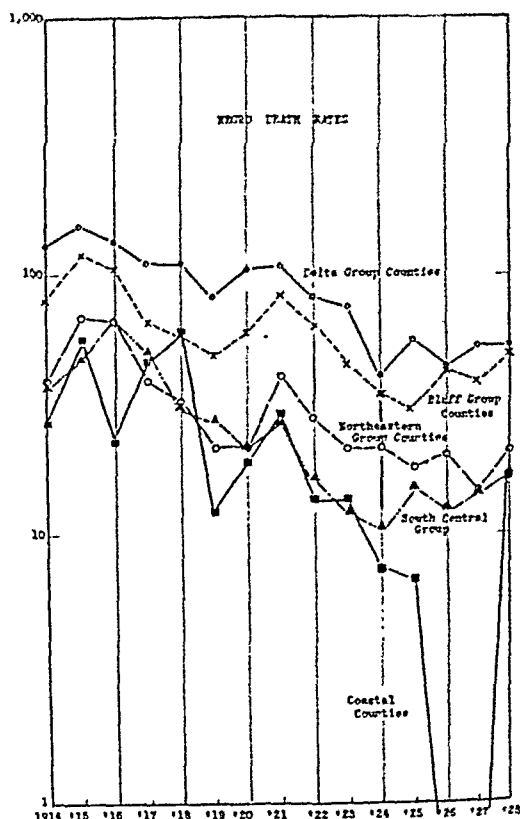


¹ Figures submitted by Dr. Boyd, Bureau of Malaria Control, Mississippi State Board of Health.

FIGURE VII

MALARIA DEATHS PER 100,000 POPULATION FOR FIVE GROUPS OF COUNTIES IN MISSISSIPPI,¹ 1914-1928

Negro



¹ Figures submitted by Dr. Boyd, Bureau of Malaria Control, Mississippi State Board of Health.

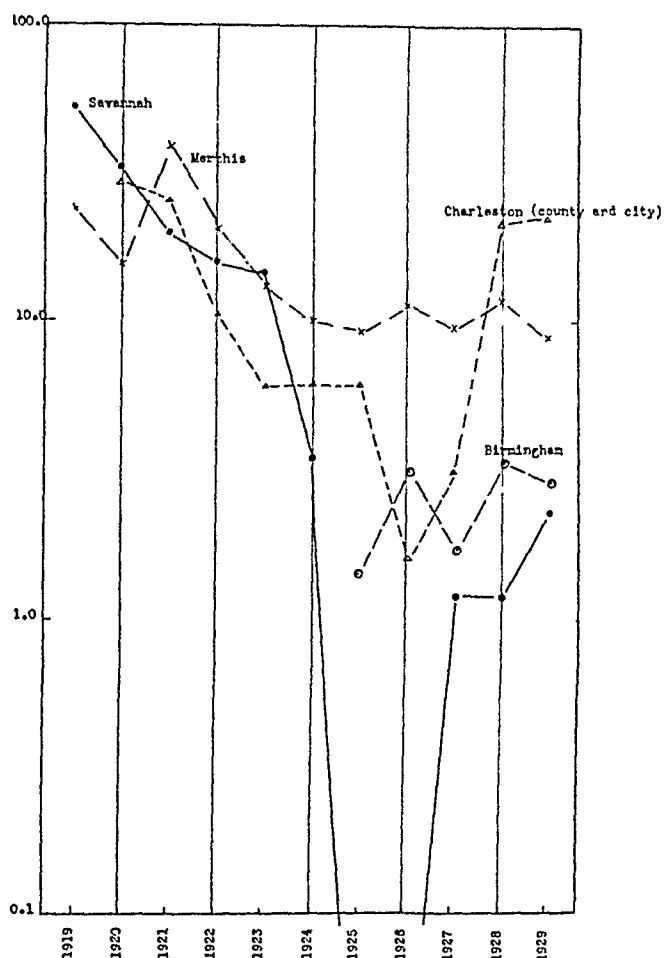
URBAN MALARIA—CHARLESTON, BIRMINGHAM, SAVANNAH, MEMPHIS

Malaria has been regarded in this country as essentially a rural disease. The studies of the past 10 or 15 years support this view. For the cities it is not easy to be sure how much of the malaria is contracted outside the city, but it is believed that in recent years the transmission within the cities, certainly within those having creditable health services, has been relatively slight. Dr. C. C. Bass supplied a record of the malaria cases in the New Orleans Charity Hospital for the period 1925 through October, 1930. There were 574 cases of which 287, or 50.0 per cent, were not residents of the city, and 30, or 5.2 per cent, not residents of Louisiana. According to Dr. Bass, deaths from malaria

are so rare in New Orleans that no definite opinion can be formed as to mortality. Only 4 deaths occurred in the total of 574 cases mentioned. In cities, the study of the age distribution of deaths and cases is important. Adults may contract the disease elsewhere, but in the case of children this is less likely. Table VIII and Figure VIII give the mortality curves for Charleston, Savannah, Birmingham, and Memphis. The record for Charleston includes the population of Charleston County as well as of the city, and it is presumed that deaths of non-residents are included. The figures for Savannah since 1923 are for city residents only. Those for Memphis presumably include all malaria deaths occurring in the city. As from one-fourth to one-half of the patients in a number of city hospitals are not residents of the city, the complete record of deaths may not correctly reflect conditions in the city.

FIGURE VIII

MALARIA DEATHS PER 100,000 POPULATION FOR
FOUR SOUTHERN CITIES



CONCLUDING COMMENTS

During the 5-year period prior to 1920, there was general interest in malaria and in measures for its control. Studies designed to evaluate the various methods of control were undertaken by the U. S. Public Health Service and the state health departments, with the coöperation of the International Health Division of the Rockefeller Foundation. Drugs, screening, and drainage were tested under varying conditions. During the mobilization of troops for the Great War, a vast amount of control work about the cantonment areas, mainly by drainage, was carried on. Coöperative experimental drainage undertaken by the health authorities in the towns was so successful over a 3-year period

TABLE VIII

MALARIA DEATHS PER 100,000 POPULATION FOR FOUR SOUTHERN CITIES

Year	Savannah, Georgia ¹			Memphis, Tennessee ²					
	Population	Deaths ²	Rate	Number of deaths			Rates		
				White	Colored	Total	White	Colored	Total
1919	81,433	41	50.3	10	24	34	10.5	44.0	22.7
1920	83,252	27	32.4	7	18	25	6.9	29.3	15.3
1921	83,698	16	19.1	22	41	63	21.2	66.4	38.0
1922	84,144	13	15.4	16	18	34	15.1	29.1	20.1
1923	84,590	12	14.2	11	11	22	10.2	17.7	12.9
1924	85,036	3	3.5	8	9	17	7.3	14.3	9.9
1925	85,482	0	0.0	11	5	16	9.9	8.0	9.2
1926	85,928	0	0.0	13	7	20	11.4	11.1	11.3
1927	86,374	1	1.2	9	8	17	7.8	12.6	9.5
1928	86,820	1	1.2	13	9	22	10.3	14.1	11.6
1929	87,266	2	2.3	8	9	17	6.2	14.0	8.8

Year	Charleston, South Carolina ⁴			Birmingham, Alabama ⁵		
	Population	Deaths	Rate	Population	Deaths	Rate
1920	67,957	19	28.0			
1921	67,374	17	25.2			
1922	66,791	7	10.5			
1923	66,208	4	6.0			
1924	65,625	4	6.1			
1925	65,042	4	6.1	218,231	3	1.4
1926	64,459	1	1.6	226,116	7	3.1
1927	63,876	2	3.1	234,001	4	1.7
1928	63,293	13	20.5	241,886	8	3.3
1929	62,710	14	22.3	249,771	7	2.8

¹ Deaths submitted by Dr. Bassett, Health Officer.² Non-residents not included.³ Figures submitted by Mr. LePrince, U. S. P. H. S.⁴ Number of deaths submitted by Dr. Banov, City Health Officer, includes deaths from Charleston County as well as the city.⁵ Number of deaths submitted by Dr. Dowling, County Health Officer of Jefferson County, Ala.

that in the last half of 1919 a program of coöperation between the U. S. Public Health Service and the state health departments—with the International Health Division of the Rockefeller Foundation participating—for extending the work to other malarious towns was instituted. This program was continued actively for 4 years during which 114 towns of 11 states were surveyed and anti-larval measures based mainly upon minor drainage were carried out.

In 1922 the extra-state agencies transferred their aid to programs involving state and county coöperation in measures for the control of

malaria in rural areas to county health organizations. As malaria had to take its place along with other health problems claiming the attention of the inadequately staffed organizations, and as the problem in rural areas is vast and far more difficult than in the circumscribed areas of the towns, the results have not been in the least spectacular. The declines in the death rates which occurred from 1922 to 1926 may have given a false sense of security and have tended to place unwarranted value on the antimalaria activities.

After a period of coöperation in both town and rural control measures, the outside agencies gradually reduced or withdrew their aid. To what extent the state and counties have increased or decreased their antimalaria activities, I cannot say. It is certain that with the marked rise in the incidence and death rates in 1927 and 1928, concern among the health officials was quite general and pronounced.

Field studies of malaria have been carried on more or less continuously in the South since 1915 by the official organizations aided by the coöperating voluntary health agencies. Knowledge as to the characteristics and habits of the 3 species of anopheles has been enlarged; the relative value of spleen, blood, and histories as bases for diagnoses and for indexes has been studied. Moreover, the conditions under which drainage, Paris green, screening, and the use of quinine or other drugs may be effective have been studied. To what extent the approach to malaria control has been influenced by the reports of these investigations is not known. It has been observed that the disease generally is more or less localized and that control measures must be aimed at the focuses of infection. In some localities, however, malaria is more or less widely and uniformly distributed. Certainly the enlarged knowledge should lead to more direct and more economical control measures.

The factors making for the general recession of malaria have not been convincingly evaluated. The extension of drainage and agriculture seems to have been related to the decline, but the influence of rainfall during the anopheles breeding season seems to be the most important single factor in the areas still classed as malarious.

The notable rise in the mortality curves for Florida and Alabama in 1929 to points higher than were recorded in the 1921-1922 peak (Figure V), and the somewhat more moderate rises in the other incriminated states make it clear that malaria is still a menace to the health and working efficiency of the people of the South, and that the measures directed against it were inadequate for holding the gains through wet years. Although the drought of 1930 may have again turned the general trend downward, this is not yet assured. Shall the

health forces let malaria have its way, or shall they influence its course and hasten its disappearance? The task offers a challenge.

We are still confronted with a disease about which we have had for years all knowledge regarded as essential, yet like another disease in this category—diphtheria—it is still with us. It thrives most in the type of community least able to combat it. Economic distress is associated with its rise either as a cause or as a result. When natural causes do not favor its recession, the health forces must redouble their activities and possess knowledge that will guide in the most direct and economical measures of control.

REFERENCE

1. Maxcy, Kenneth F. *Pub. Health Rep.*, May 25, 1923 (Reprint No. 839).

DISCUSSION

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DR. FERRELL'S paper should arouse a wider interest in following the future trend of malaria prevalence. It certainly looks as though a change that we do not understand has taken place in parts of some states during the past 3 years. It has even been noticed in Illinois and southern Indiana. In the latter state the change was not due to local rainfall.

It is most unfortunate that information is available only for limited areas when there are malaria problems in 520 counties. Dr. Ferrell brings out the point that we have more complete reporting than we had in former years, and that is encouraging. I believe that it is possible for a larger number of county health units to get case records which would indicate more closely where the county malaria problems are, and that such information would be of value to the state health departments. It will be of interest to compare the reported case rates with death rates in county areas, to see the relative value of the two trends, when plotted with such data as are available, where the reporting is fairly complete.

Attention is called to the fact that since 1926 a start has been made toward the rural problem of malaria control and that we very much need more complete reporting by practising physicians in order to measure the results of anti-malaria activities over a period of years. The representative of the International Health Board in Mississippi has accomplished an outstanding piece of work in the delta counties of Mississippi this year and if we can have similar interest aroused in the malaria ridden counties of other states, we can get enough people to become interested in our problems to keep the trend of malaria where we want it. It is well worth while for the directors of county health units to make a strong effort to enlist the aid of the county medical society, and county physicians, in the reporting of all their malaria cases. Where this is not done they have no definite idea of where their problems lie.

It is my belief that the downward trend of malaria will be in direct proportion to the effort put forth on having the farm tenant population thoroughly understand

the need of their taking part in this reduction. We all realize the importance of having the carriers sleep in screened homes, and some county health departments have already shown that in years of average prosperity both plantation owners and tenants can be induced to pay for such protection in districts where other anti-malaria measures cannot yet be carried on. Such procedure is applicable to many localities where malaria is more or less widely distributed, and intensive study is needed to determine the best methods along this line, which can be made to increase the downward trend of malaria prevalence.

In Alabama, in September, 1928, 2,000 cases of malaria were recorded by physicians, in August, 1929, 2,879, and as this is only a portion of the cases that occurred among the rural population it is evident that we cannot afford to assume that our malaria problem is not worthy of attention.

V. M. EHLERS, C. E., F. A. P. H. A.

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OUR discussion of Dr. Ferrell's paper will relate only to conditions as they obtain in Texas. Exact statistics on the incidence of and deaths from malaria are not available. According to Dr. J. C. Anderson, State Health Officer, who practised years ago in central Texas, the bulk of his work 30 or even 20 years ago consisted in the treatment of malarial patients. A steady decline in the number of cases was noted up to about 10 years ago, which he believes was due to the efforts of physicians in educating the population as to the value of taking quinine, the screening of homes, and the destruction of mosquito breeding places as the country developed and farming conditions improved. Dr. Cumming, a prominent physician who has practised for many years at Hearne, in the malaria belt, concurs in Dr. Anderson's statements.

Surveys by Magoon and Hardenburg in 1919 and 1920 of a certain group of towns in east Texas showed 10 per cent to 35 per cent of the population affected with malaria. Surveys by Dr. William Sory in 1921 and 1922 in Cherokee County show a rate varying from 2.8 per cent in a town to 38.8 per cent in a rural district.

Records of the Cotton Belt Railway show a decline in the number of cases noted among their employees at the beginning of their control work in 1917. The 1913-1916 average showed 602 hospital cases per year from about 6,600 employees and the 1928-1929 average showed 68 hospital cases per year among approximately 6,000. Malaria deaths reported to the State Department of Health over a 20-year period declined from 407 in 1910 to 238 in 1929, with the lowest figure at 139 in 1926. The malaria death curve graphically shows a steady decline up to the last 4 years. Records of cases are not available except for the past 4 years. For that period the total cases reported for the state were: 12,542 in 1926; 8,823 in 1927; 13,623 in 1928; and 15,697 in 1929. It is estimated, however, that only about 40 per cent of the cases are reported; hence, we have at least 50,000 cases annually in Texas. According to the estimates of 1928, the population of the 108 counties affected was 3,266,000. For the 4-year period named the rates in consecutive order are 380, 239, 417, and 480—or an increase of more than 100 cases per 100,000 in 1929 over 1926.

In order to study the relation of the rainfall of the section to the incidence of

malaria, data on the average precipitation for the 4-year period were compiled. Figures from the U. S. Weather Bureau showed an annual precipitation of about 49.7 inches in 1926; 43.7 in 1927; 38.7 in 1928; and 44.1 in 1929. The lowest figure is for 1928, whereas the lowest number of malaria cases was reported in 1927. From this very limited comparison, we would say that the variation in rainfall apparently had no effect upon the number of cases reported.

We made a further selection of a group of 11 counties which showed the highest incidence of malaria according to physicians' reports for the 4-year period and determined the case rates by the estimated population of 1928. See Table I for a tabulation of these figures.

TABLE I

County	Population	Rate per 100,000 (Av. for 4 yrs.)
Morris	10,298	3,175.0
Red River	35,829	1,102.0
Nacogdoches	28,457	1,049.0
Lamar	55,742	1,011.0
Kaufman	41,276	940.0
Fannin	48,186	940.0
Hunt	50,350	810.3
Collin	52,000	669.0
Cameron	65,000	444.6
Wichita	115,000	362.0 (For 1929 only)
Hidalgo	75,000	344.0

Wichita County is included in this group, although it is well beyond what is ordinarily termed the malaria belt of Texas. Irrigation was introduced in Wichita County on rather a large scale in 1926. In 1926, 3 cases of malaria were reported, 31 in 1927, 9 in 1928, and 417 in 1929—a rate of 362 per 100,000 population as indicated above. The high incidence in Hidalgo and Cameron counties may likewise be attributed to the effect of irrigation. Each year sees more land irrigated—and a greater incidence of malaria. Referring again to Cherokee County, in 1919 the town of Jacksonville reported over 800 cases of malaria, which after persistent control work declined to 7 in 1929. Other towns which have carried on control work year after year show a decline. A low level has been reached which never rises to that of 20 years ago. Intensive work is being carried on in about 40 towns at present, while possibly 100 or more do some work of an intermittent nature.

The State Department of Health is asking for an appropriation for malaria control work for the coming biennium. If granted, the money will be expended in employing county sanitarians or "mosquitoologists," and the establishment of county units in the malarial sections. An educational campaign put on recently by the department had the active support of the East Texas Chamber of Commerce. Through addresses made before a population of some 25,000 persons in the 40 towns visited, an attempt was made to arouse interest in the problem. The enormous economic losses were recounted and compared with the cost of control. It is hoped to continue educational work through the spring and summer, and, if possible, induce all counties affected to carry the work into the rural communities.

In the opinion of our epidemiologist and others conversant with conditions, malaria in Texas is now primarily a rural problem. It has reached as low a level as is possible without further intensive work which should be extended to the rural districts on a widespread basis.

FELIX J. UNDERWOOD, M. D.

State Health Commissioner, Jackson, Miss.

IN 7 months, January to July, 1930, there were reported 122 deaths ascribed to malaria as against 118 in same period of 1929. In each year there were reported 46 deaths in whites during the same period. Of the white deaths in 1929, the diagnosis in only 2 was reported as having been verified by microscopical examination, against 11 in 1930. In none of the 1929 negro deaths had the diagnosis been verified, while in 1930, 5 were. It would appear that some progress is being made in the more precise diagnosis of malaria.

For the period considered, the mortality reports do not indicate a significant difference in the incidence of malaria in 1929 and 1930. It is the present belief, however, based on diagnostic laboratory examinations, the results of field surveys, and data gathered from practising physicians, that in our delta territory the incidence of malaria in 1930 is lower than in 1929, and perhaps is the lowest on record. This is attributable to the severe drought.

The malaria control program in Mississippi is executed by and through the whole-time county health departments and is largely directed to the rural problem. It has been developed with a full appreciation of the meager resources and varied responsibilities of these organizations. It is realized that the accomplishments of any one year can only be modest in extent, and that satisfactory results require sustained, uniform efforts over an extended period. The supervision of the State Board of Health should guarantee the continuity of this program.

In brief the program is:

1. Education of physicians to be more precise in making a diagnosis of malaria, and requirement of the reporting of cases individually with particulars regarding place of residence. The health departments are required to keep spot maps of these cases.

2. Popular education, carried on largely through the movies, some of which is particularly designed to reach the negro.

3. The promotion of screening.

4. The promotion of minor drainage.

The first year's operation has demonstrated the workability of this program, while in several counties very satisfactory progress has been made.

OUTLOOK FOR 1931

We regard the situation in 1931 with concern. It is desirable to conserve to the greatest extent possible the natural gains of 1930, yet the current economic depression will probably make it difficult to accomplish as much.

Cost of Malaria Control*

J. A. LePRINCE

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COST of malaria control includes medical treatment and preventive measures such as larval control of anopheles, screening of houses, use of mosquito bars over beds and destruction of anopheles in homes.

In towns and villages where larval control is being accomplished it is generally the desire of the public that the work be done in such a manner that not only shall there be a reduction of malaria but also a most decided reduction of pestiferous mosquitoes. In most instances as the campaign advances it obtains approval or disapproval according to the prevalence or absence of non-disease bearing mosquitoes, and this condition has often compelled the field workers to undertake the elimination of *stegomyia*, *Culex fatigans*, and other mosquitoes, as well as *Anopheles punctipennis*. We have communities where several times as much is being spent for control of *Anopheles punctipennis* as for reducing the prevalence of *Anopheles quadrimaculatus* and treatment is given to stream beds where it is known that no *quadrimaculatus* are produced. Frequently it is not practical to separate the cost of anopheles control from that of general mosquito control, and therefore the cost of the latter is given as that of anopheles control, although at times it is several times more than what the cost of eliminating *Anopheles quadrimaculatus* would be.

In 1913 and 1914 the field working parties of the U. S. Public Health Service found that in Georgia, North Carolina and South Carolina when the *Anopheles quadrimaculatus* was not present there was very little or no history of transmission of malaria, though in some of the communities studied imported malaria carriers were present and *Anopheles punctipennis* were very numerous. This species was decidedly annoying to persons on porches after dusk but did not appear to frequent inhabited houses, though frequently found in the daytime in outhouses and unoccupied houses as well as under occupied homes raised from the ground.

The spending of millions of dollars annually for mosquito wire

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

screen seems to indicate that the public desire mosquito freedom and think more of that than of freedom from malaria. It is not unusual to find a large portion of the homes screened where no malaria exists and very few screened where malaria prevalence is unusually high.

During 1920, 45 towns and villages initiated malaria control campaigns. The cost per capita for anti-larval measures varied from \$.42 to \$2.52, and averaged \$.80. During 1921, 26 other towns initiated similar campaigns and the cost per capita averaged \$.72. These costs are from towns of 10 southern states for the first year's work and naturally include considerable installation of new ditches. The cost of maintenance the second year and thereafter will run about one-quarter to one-third of that of the first year. The anti-larval measures refer to ditching, maintenance of ditches, and application of larvicides, and the costs are of mosquito control not of *Anopheles quadrimaculatus* only.

In tropical countries having heavy rainfall, long rainy seasons and clay soils, the cost of larval control is relatively high and application of oil is unusually high because of interference of oil spread by quick growing vegetation.

While the Panama Canal was being constructed the cost of mosquito control activities, exclusive of screening homes, was approximately \$.01 per capita per day. Of course, that meant operating about 300 days each year, while in the greater part of our malaria belt here the mosquito control period is only about 130 working days for the anopheles season. The annual rainfall at Panama is from 60 to 180 inches per year according to location. In our short anopheles season here we often have dry periods with less anopheles breeding area.

A cost of \$3.65 per capita per year may seem high, but is actually relatively low as compared to average loss of wages when more than three-quarters of the people are suffering from malaria where preventive measures are not undertaken.

It is not generally known that millions of dollars are being spent in our southern states for the prevention of malaria by agencies developing hydro-electric power. Some of the artificial lakes being formed in our river valleys have shore lines varying from 12 to several hundred miles in length. Clearing of brush and trees from some of the larger projects to prevent anopheles production is decidedly expensive and exceeds $\frac{1}{4}$ million dollars for a single project. Where there are but 200 families within anopheles flight range of a lake that costs \$100,000 to clear, the cost per family for protection from malaria is \$500. In the *Southern Medical Journal*, May, 1930, Dr. L. T. Coggeshall reported that Lake Murray, being constructed near Columbia, S. C., will have an area of 75 square miles, a shore line of about 540

miles, and the cost of clearing will approximate $2\frac{1}{2}$ million dollars. The annual interest on this sum is probably more than all state health departments are able to obtain to apply to malaria elimination.

With the discovery and use of Paris green as a larvicide for *Anopheles quadrimaculatus* we have a new condition—a larvicide that does not destroy the larvae of pestiferous mosquitoes, but which will often enable us to control anopheles at possibly one-quarter of the cost of destruction of all types of mosquito larvae. When there is much aquatic growth, brush, and floating débris present, we cannot always control anopheles production areas effectively and economically by the use of oil, but when we use Paris green mixed with hydrated lime such obstructions in no way interfere with dusting operations; so we have a quicker, cheaper and better means of control than formerly. In other countries this cheaper method is being widely used while with us, where the method originated from investigations of the U. S. Public Health Service, it is not yet in common use.

During 1929 Dougherty County (Ga.) Board of Health dusted with Paris green at 10-day intervals all *Anopheles quadrimaculatus* breeding areas in Dougherty County. The cost was \$7,957, and the area of the county was 343 square miles. The cost per acre per season was \$.036. In studies made in Tennessee it was found that in a stagnant stream bed about 5 feet wide, a man with a hand dust gun carrying a charge of 10 lb. of Paris green mixture could cover from 3,000 to 4,000 linear feet of stream bed per hour, depending on variation of air currents.

During this operation it was necessary for the operator to cross the stream a number of times because of the changing direction of the axis of the stream bed with respect to the prevailing direction of the wind. In dusting large areas throughout the anopheles season there will be considerable variation of cost depending on the amount and frequency of rainfall. In county-wide dusting operations to date, the cost for labor and Paris green mixture for the entire territory (wet and dry included) varied from $\frac{1}{3}$ to $\frac{1}{2}$ cent per acre per dusting, but of course this cost may vary more widely according to the extent of wet area of any county that is suitable for *Anopheles quadrimaculatus* production.

In some states and counties we find malaria prevalent in sparsely settled rural districts. Where the income of such counties is small and the counties are not yet ready to undertake larval control as a malaria control measure, screening of farm homes and of farm tenant homes should be considered. During the summer of 1927 the Red Cross and the U. S. Public Health Service screened about 8,000 farm tenant homes in the flood area of the Mississippi River in 4 states. The average cost was \$10 per home. In the counties of Mississippi there was

an average of 3-and-a-fraction screen doors per home. As this malaria protection measure lasts for from 4 to 5 seasons, and even longer where the screen is painted, the cost per year averages from \$2 to \$2.50 per family per year for the first 5 years. As reinforced doors are used they last a long time, and those installed in 1922 are as good as when first installed. For an average family of 5 this cost becomes about \$.50 per person per year.

Eight county health officers have already undertaken screening campaigns and one of them visited the hardware dealers of his county to find out whether his activities were decreasing the sale of screening by hardware dealers. He was told that since his campaign got under way from two to three times the normal amount of window screen and screen doors had been called for. It has also been noticed that where county-wide screening campaigns are undertaken a considerable number of tenants and owners build their own screen doors, and then the cost per capita per year is considerably reduced, as this work is done in spare time. Where tenants buy and use the cheapest type of screen door they can get, they should be advised to reinforce doors on both sides with 22 gauge galvanized iron, 6 inch right triangles in order to double the life of the doors.

In some of the counties having the highest malaria prevalence a large portion of the farm tenant families are spending almost as much for bed mosquito bars as it would cost to keep the house effectively mosquito proof. Most of these bed nets have holes in them. Many sanitarians, as well as these people, are unaware that a mosquito bar is a preferential resting place for anopheles and that more than half of the people who sleep under bed nets are bitten while they are asleep when they come into contact with the cotton mesh. Of all measures used by the American public for malaria control the use of bed nets is the poorest and probably the most expensive considering the small benefit actually received.

It does not take long to persuade colored farm tenants to care for the screen protection on their homes. It is essential to do so. In one of the Mississippi River counties the owner of the largest cotton plantation area states that the screening of his colored farm tenant homes and keeping them screened is the best investment he ever made.

It is unfortunate that we have the greatest proportion of unscreened homes in rural areas having the highest malaria rates, and the property owners do not yet realize that unseen taxes are collected from them which greatly exceed the cost of screening of farm tenant homes. County health workers will find that it is in this type of home that we have most sickness and most fly-borne disease.

Screening and Mosquito Proofing as Elements in Malaria Control*

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THE Tennessee State Health Department program is essentially a county health department program. With this in mind, our county-wide malaria control programs have been built up around the full-time county health departments, and the malaria program has been made an active part of their work and sponsored locally by them. The local health departments do not do malaria control work exclusively, but carry it along as one of their major activities in their general health work. There are 9 full-time county health departments in that section of the state in which malaria is of public health significance, 5 of them located in the counties having the highest malaria morbidity and mortality.

The principal malaria control problem lies in the western third of the state between the Tennessee River, which traverses the entire width of the state, and the Mississippi, our western boundary. This area is approximately 100 miles long and 100 miles wide, mostly flat, with many low hill sections. Streams are sluggish, and there are many places for mosquitoes to breed in easy flight range of most of the houses. In this section the Tennessee Department of Public Health has concentrated its major malaria control activities. Screening and other mosquito proofing of houses have been the major activities. These are important methods of malaria control, particularly where other methods of county-wide control are not economically feasible, or have not been developed far enough to demonstrate that they will insure fair results for money spent.

Screening alone must not be confused with mosquito proofing. In a large percentage of tenants' homes in Tennessee screening of the doors and windows is only part of the job of preventing the ingress of anopheles. Carpenter work is often necessary, floor cracks have to be stopped up or covered, walls papered to cover cracks or holes, naphthalene put into the chimneys and other work done. In addition, inten-

* Read before the Public Health Engineering Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

sive educational programs are carried on emphasizing the proper use and care of the screens as well as general malaria prevention.

Three municipalities have recently passed city-wide house screening and mosquito control ordinances: Memphis, Humboldt, and Milan, with populations of 252,000, 4,500 and 3,500, respectively. Memphis at present has one of its best sanitary officers devoting his full time to this work. He has the advantage of the previous experiences of the Shelby County Health Department in methods of promotion, measuring for screening, making and hanging screen doors, and observing the various other methods of mosquito proofing.

Before we advocate a screening program, a careful study is made of the malaria incidence. This is usually a combination of case histories, blood indexes of school children, both white and colored, and spleen examinations.

The first screening in Tennessee was done in Lake, Shelby, Dyer and Lauderdale Counties, by the American Red Cross, in 1927, after the big Mississippi River flood of that year. At present, Lake, Shelby and Gibson Counties have county-wide screening programs. Because the financing and general procedure in each of the 3 counties is quite different, it will be of interest to discuss briefly each of the plans.

LAKE COUNTY MOSQUITO PROOFING PROGRAM

Lake County is low and flat and lies between Reelfoot Lake and the Mississippi River. The county is traversed with sloughs, and almost every house is within flight range of a *quadrifasciatus* breeding place. Cotton is the chief crop, and there are only two towns in the county, neither of which is over 1,200 in population. The population is of the tenant-farmer type and some 12 land owners control or own possibly 80 per cent of the land.

Early in 1928 the larger land owners were invited to a meeting, which included several county officials. A county antimalaria committee was formed, consisting of 5 principal land owners, 1 from each section of the county. This committee provided a revolving fund of \$600 and secured from hardware and lumber firms a 90-day credit allowance, equivalent to approximately \$2,000, total assets to be used by the committee for the manufacture of screen doors. Excellent factory quarters were obtained free of charge, and equipment used by the Red Cross in 1927 was installed.

The doors were patterned exactly in accordance with the design of the U. S. Public Health Service. A door identification card was developed, also other forms for adequate house surveys to show sizes and direction of swing of doors, sizes of windows, and other data. At

present, approximately 90 per cent of the county has been screened.

One large land owner gave us to understand, early in the campaign, that she would never do any screening. We screened all around her property, and when tenants began to move to other places where mosquito proofing was available, she changed her mind. Needless to say, her own house was completely screened with 16-mesh wire.

For mosquito proofing the walls and ceilings, we have utilized used cotton sample paper. This is very tough and heavy, difficult to tear, and is used to wrap up cotton samples for shipping. Thousands of pounds of this are received in Memphis yearly, and not used again. However, local junk dealers buy all of this paper possible; hence, we have keen competition in securing it. We secured many tons free from philanthropically inclined cotton dealers, and later through the endorsement of the Memphis Cotton Exchange we were given all paper from each member firm except one.

The paper is 4 ft. wide and comes in varying lengths, from 2 to about 15 ft. The enormous amount required to paper an entire county is indicated by the fact that at one time, in Lake County, we had enough paper to cover a wall 8 ft. high and 13 miles long.

Shelby County Health Department collects the paper by truck on regular schedule; at some places every day, at some every other day, and at others not so frequently. It is then rerolled in small bundles, which reduces waste and enables the distributor to leave more nearly

TABLE I. POUNDS OF PAPER FOR ROOMS. *Cotton Sample Paper Only*

NOTE.—1 pound of paper covers 34 square feet. No allowance made for doors and windows

Length in feet	Width of room in feet												
	6	7	8	9	10	11	12	13	14	15	16	17	18
	Ceiling 7 feet high												
6	6.4	7.0	7.6	8.2	8.9	9.5	10.1	10.5	11.3	12.0	12.6	13.2	13.8
7	7.0	7.7	8.3	9.0	9.7	10.3	10.9	11.6	12.3	13.0	13.7	14.4	15.1
8	7.6	8.3	9.0	9.7	10.4	11.1	11.8	12.5	13.3	14.0	14.7	15.4	16.1
9	8.2	9.0	9.7	10.4	11.1	11.8	12.6	13.3	14.0	14.7	15.4	16.1	16.8
10	8.9	9.7	10.4	11.1	11.8	12.5	13.3	14.0	14.7	15.4	16.1	16.8	17.5
11	9.5	10.3	11.1	11.8	12.5	13.3	14.0	14.7	15.4	16.1	16.8	17.5	18.2
12	10.1	10.9	11.8	12.6	13.3	14.1	14.9	15.7	16.5	17.2	18.0	18.8	19.6
13	10.6	11.6	12.5	13.3	14.2	15.1	16.0	16.9	17.8	18.7	19.6	20.4	21.3
14	11.3	12.3	13.3	13.9	14.7	15.6	16.5	17.4	18.3	19.2	20.1	21.0	21.9
15	12.0	13.0	14.0	14.9	15.8	16.7	17.5	18.4	19.3	20.2	21.1	22.0	22.8
16	12.6	13.7	14.7	15.6	16.6	17.7	18.6	19.6	20.5	21.5	22.4	23.4	24.1
17	13.2	14.4	15.4	16.4	17.4	18.5	19.6	20.5	21.6	22.5	23.5	24.6	25.6
18	13.8	15.1	16.1	16.8	17.5	18.2	19.6	21.3	21.9	22.8	24.1	25.6	26.3

A table is used showing amounts of paper necessary in pounds for various sized rooms, varying in height from 7 to 10 ft., inclusive, in width from 6 to 18 ft., inclusive, and in length from 6 to 18 ft., inclusive (see Table I). With this table, a sanitary inspector can tell at a glance, after measuring up the room, exactly the amount of paper needed, put it down on his survey sheet in the field, and not have a mass of calculating to do in the office. A "tack factor" is also given on the paper table, so that the amount of tacks needed can be immediately determined.

In Lake County, we believe we have the first county in the United States with county-wide house numbering. The county is divided into 8 districts and the houses in each are numbered serially. The first digit in each house number is the number of the civil district in which the house is located. This method enables one to know at once the exact location of each house. The house locations were spotted on maps, so that the health officer, nurse, or sanitary officer can easily find them. This system enables the numbering to be carried on satisfactorily as new houses are built in each district, and not have perchance a very large number alongside of a small one.

This is the only method by which houses can be positively identified from year to year, where there is a large tenant turnover. For example, where there are 20 houses scattered over a farm and the tenants change houses or new ones come in, there is no other method of identification that is so accurate as numbering. Numbering is of distinct value to the health officer with regard to other activities, such as locating cases of communicable disease. He, or any member of his staff, can go directly to a house and not spend a long time in finding the place in which a call of a few minutes is to be made. It also aids in mapping locations of satisfactory water supplies and sanitary privies.

I would like to refer particularly to the cost of numbering the houses in Lake County. The numbers were hand-stamped on galvanized sheet iron plates 1" x 3" by a sanitary officer. The sheet iron was waste, secured free from furnace and tin repair shops, and later cut to the desired size. The numbers were stamped on the metal with steel number punches, each figure being $\frac{1}{2}$ inch high. The set of number punches (0 to 9, inclusive) cost \$3.50. The numbers were nailed on the houses directly over the front door, or near the top of it, with a nail in each end of the plate to make removal difficult. Exclusive of the time of the sanitary officer, during which he was incidentally engaged in a general house-to-house survey, it is estimated that the total cost of the county-wide house numbering has been not more than \$10.

Each lumber dealer and hardware merchant was interviewed in regard to making and selling the U. S. Public Health Service type of door. Most of the hardware men had friends who were lumber dealers who would make screen doors for them at a price which would allow them a profit. A meeting of all dealers was held and \$2.25 per door agreed upon. The dealers also agreed not to sell any more screen wire with a mesh larger than 16 to the inch after the stocks on hand were exhausted. Several of them had been selling only 16-mesh wire for a long time. The County Health Department agreed to do all of the propaganda work through the newspapers, and the State Department of Health loaned its journalist to write articles concerning the program and the particular type of screening. These were distributed regularly to each newspaper in the county.

The towns of Humboldt and Milan both passed home mosquito proofing ordinances as well as the standard mosquito ordinance of the U. S. Public Health Service declaring it a nuisance to raise mosquitoes on private premises.

There are 8 incorporated towns in Gibson County, so distributed geographically that citizens can secure U. S. Public Health Service type screen doors and 16-mesh wire from their local dealers in any section of the county.

SHELBY COUNTY MOSQUITO PROOFING PROGRAM

Memphis is located in Shelby County. There is a densely populated district adjoining the city on three sides. The county is largely composed of low lying hills, bordered on the west by the Mississippi River and traversed by two fair sized rivers and a number of creeks. Cotton and corn are the principal crops. There are many small communities scattered throughout the county.

The county-wide screening campaign was started by the organization of an antimalaria committee with an active general chairman who is vested with power to act in accepting contracts, paying bills, and in the general conduct of the screening. The county commissioners gave \$1,000 for a revolving fund and, in addition, furnished trucks free of charge for the transportation of screen doors and screen wire, collection and distribution of paper, and for other materials and labor.

One reason for the success of screening in Shelby County is that all of the sanitary officers were put through a rigid training in screening. They were taken into the field and taught how to measure doors and windows. Afterward, they went into the shops and actually made the doors and then hung them, and screened the windows. In this course of training they were taught to measure up and inspect screening;

hence their efficiency in screening promotion work was very much improved. When they were sent out to sell screening, they were able to tell about it intelligently because they had done it themselves.

OTHER WORK SUPPLEMENTARY TO SCREENING

The Tennessee Department of Public Health has an all around balanced malaria control program. In addition to screening and often supplementary to it, it is carrying on active programs in:

- Impounded water control
- Municipal mosquito control
- Consultant service to city and county health officers on special malaria control problems
- Combined land reclamation and mosquito control
- Plasmochin demonstration and studies
- Schoolchild surveys in spring and fall for malaria in certain counties
- Paris green dusting
- Roadside borrow pit control
- 1. State Highways:
 - By clause in State Highway specifications, requiring proper drainage of all borrow pits along state highways.
 - By a definite contract, the State Highway Department is now draining borrow pits along state highways left undrained before establishing the drainage clause.
- 2. County Highways:
 - Similar programs are being worked out for county roads.

Pasteurization of Milk

EXPERIENCE has shown that where pasteurization (the heating of milk under conditions which insure the destruction of harmful bacteria, yet leave the vitamins unimpaired) is generally practised, infection traceable to milk recedes almost to vanishing point. This fact has led no fewer than 21 cities in the United States to ordain the compulsory pasteurization of milk.

The signatories, while expressing no opinion on the principle of compulsion, are emphatically agreed that the time has arrived when, in order to increase milk consumption and diminish the risk of milk infection, pasteurization should be universally recognized as the immediate practical method of insuring safety. They record their satisfaction at the fact that about 90 per cent of the London supply is pasteurized with markedly beneficial results.

They are of the opinion that the first step in educating the public to demand pasteurized milk should be the simplification of the present milk grading system and the clear labelling of pasteurized milk as such. They are further of opinion that while no effort should be relaxed to improve milk at the source, the entire milk-supply—excepting "Certified milk"—should be pasteurized.—From Letter to Editor of *The Lancet* from Lord Dawson of Penn and others, Dec. 13, 1930.

The Olean City Epidemic of Typhoid Fever in 1928*

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AN epidemic of 248 cases of typhoid fever occurred at Olean, N. Y., in the fall of 1928. This was due to a break in the submerged suction pipeline from a well in the Allegheny River and insufficient chlorination of the water supplied to the city. Of the total number of persons infected, 214 were residents of Olean City. Of the remainder 18 were from Cattaraugus County, 9 from elsewhere in New York State, 6 from the adjoining State of Pennsylvania, and 1 from West Virginia. The case incidence for the residents of Olean City, with an estimated population of 21,599 in 1928, was almost exactly 1 per cent of the population. There were 25 deaths, including 20 residents of Olean City, giving a 10.1 per cent fatality rate for the total cases.

The investigation and management of the typhoid epidemic during October and November, 1928, were under the supervision at Olean of Dr. B. E. Roberts, State Epidemiologist. The annual report of the New York State Department of Health for 1928¹ records the epidemiological features of the outbreak which was easily shown to be water-borne.

City water was used by all the persons affected and there was no other factor common to a significant proportion of the cases. There were in Olean over 1,000 cases of gastroenteritis in January and February, 1928, and over 5,000 during the latter half of August and the first half of September, prior to the onset of most of the typhoid fever.

The water supply of Olean was derived from two sources, Olean Creek and South Olean wells. Olean Creek water, which was filtered, chlorinated, and pumped into the distribution system at North Olean, was found by daily tests to contain residual chlorine and to be free from *B. coli*. The auxiliary South Olean well supply came from 12 or more 6" and 8" tubular wells sunk about 72' deep in the low ground

* Read before the Epidemiology Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

on the north side of the Allegheny River and from a large open collection and suction well on the south bank of the river. Two of the tubular wells had become submerged within recent years by changes in the course of the river. Water from these wells passed by screw-joint iron suction pipes across the river bed to the collection and suction well. After chlorination, instituted by a device which operated by remote control when the electric pump was started, the water was forced into the distribution system. Raw sewage from nearly half the city entered the river and its tributary above the wells.

On September 8, 1928, a man heard a suction noise in the vicinity of one of the submerged wells and reported it to the city water department. On September 10 the suction pipe leading from a submerged well was found to be broken and the well was cut out. Early in the morning of September 13 the use of water from the South Olean wells was discontinued for all time.

There was failure to make daily or regular tests of the South Olean water for residual chlorine, so additional chlorine was not added to take care of the polluted river water. Nine of 16 South Olean water samples examined at the city water department laboratory in July, August, and September, gave presumptive tests for *B. coli*, and a sample of water taken on September 13 at the Cattaraugus County Laboratory in Olean contained confirmed *B. coli*.

The typhoid epidemic cases were concentrated more than the population in the southern and central parts of Olean, which were supplied most directly with South Olean well water.



FIGURE I—Tubular Well in Allegheny River

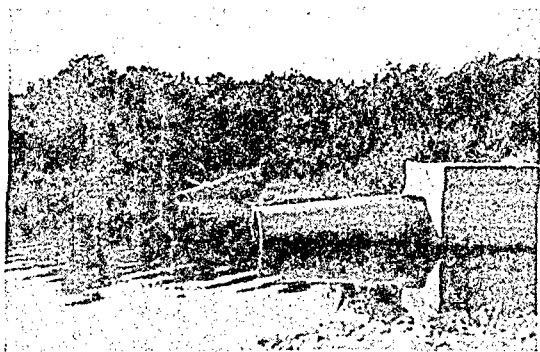


FIGURE II—Sewer Outlet at Allegheny River

DATES OF FIRST SYMPTOMS OF TYPHOID FEVER

The dates of first symptoms of typhoid fever for the 248 patients, including 8 known secondary cases, are shown by the accompanying histogram (Figure III). Ninety-seven per cent of the onset dates for the primary cases from August 21 to December 8, 1928, were in Sep-

TABLE I

INCUBATION PERIOD OF TYPHOID FEVER FOR EIGHT OLEAN VISITORS

Patient			Incubation Period in Days	
Initials	Sex	Age	Range	Mean
C. N. G.....	M	38	3-5	4
H. W.....	M	24	8-10	9
D. G.....	F	15	10	10
C. W. G.....	M	38	10-12	11
I. O. W.....	M	51	18	18
D. C. O.*.....	M	12	23-25	24
L. S.....	F	29	26	26
M. B.....	M	19	29-30	29.5
Mean.....		28		16.4
Median.....		26		14.5
Range.....		12-51	3-30	4-29.5

* Died.

tember and October, including 74 per cent in September. There were 18 cases with onsets on each of 3 days, September 23, 27, and 30. One hundred twenty-eight patients or more than half the total had first symptoms during the 9 days September 23 to October 1, for which September 27 is the mid-date.

FIGURE III

Dates of First Symptoms of Olean Epidemic Typhoid Cases
August 21 to December 9, 1928

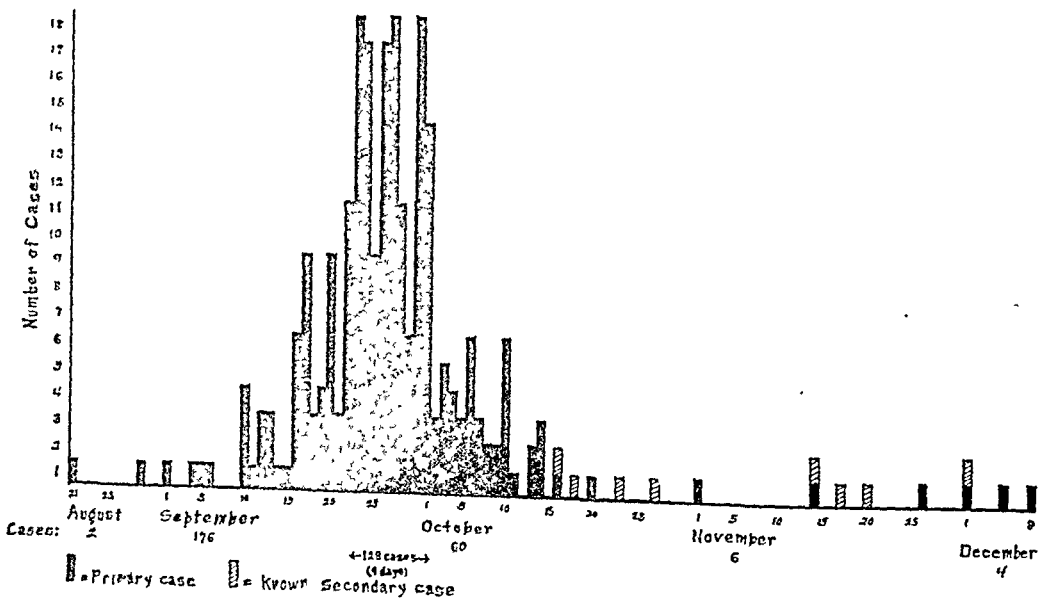


TABLE II

Epidemic	Number of Cases Used	Incubation Period in Days	
		Mean	Range
Mankato, Minn., in 1908.....	21	13.81	5-29
Excursion steamer reported by Lumsden in 1912.....	13	19.38	7-38
Old Salem Chautauqua reported by Feiguson in 1916...	181	19.50	7-40

There was one visitor to Olean on August 11 and there were 7 from September 8 to 12, inclusive, for from 1 to 3 days, who later developed typhoid fever (Table I). Assuming that infection occurred on the mid-day, the mean incubation period was 16.4 days and the range was from 4 to 29.5 days.

As noted previously, the mid-date for the most of the typhoid cases was September 27. This was 17 days after the removal of the defective pipe in the Allegheny River.

The mean incubation periods for other water-borne typhoid epidemics are given by Miner in Table II.²

The 8 Olean typhoid cases had a mean incubation period midway

TABLE III
AGE AND SEX OF OLEAN TYPHOID CASES AND DEATHS

Age Group	Total in Epidemic				Olean City Residents			
	Cases		Deaths		Cases		Deaths	
	M	F	M	F	M	F	M	F
Under 5.....	7	4	0	1	4	4	0	1
5-9.....	10	9	2	0	9	9	1	0
10-14.....	15	16	0	3	13	16	0	3
15-19.....	13	17	1	2	12	16	1	2
20-24.....	21	9	0	2	17	7	0	1
25-29.....	15	15	1	2	11	9	1	1
30-34.....	14	8	2	0	13	8	2	0
35-39.....	8	10	0	1	5	10	0	1
40-44.....	8	7	0	1	6	7	0	1
45-49.....	6	7	1	1	6	6	1	0
50-54.....	10	7	1	0	9	6	1	0
55-59.....	1	3	1	0	1	3	1	0
60-64.....	1	1	0	0	1	1	0	0
65-69.....	1	2	1	0	1	2	1	0
70-74.....	3	0	2	0	2	0	1	0
All Ages.....	133	115	12	13	110	104	10	10
Total.....	248		25		214		20	

between that for the Mankato patients and the periods for the individuals in the other two epidemics.

Sex—There were 18 more males than females among the 248 persons who had typhoid fever, including an excess of 12 males in the list of 34 patients who were not residents of Olean City. The percentage of males for the Olean residents was 51.4 and for the non-residents 67.6.

Age—The ages of the 248 patients ranged from a female contact case 18 months old and a female primary case 34 months old, to a male primary case 74 years of age. There were 11 children, including 7 males, under 5 years of age, 19 more 5 to 9 years and 12 persons of 55 years and over. The remaining 206, or 83 per cent of the total, were age 10 to 54 years.

All who had typhoid fever were white persons except for a male negro, age 54 years. According to the state census in 1925 there were in Olean 229 colored persons.

TABLE IV
TYPHOID ATTACK RATES FOR OLEAN CITY RESIDENTS BY AGE GROUPS

Age Group	Population *	Typhoid Cases among Olean City Residents	
		Number	Per 1,000 Population
Under 5	2,264	8	3.5
5-9	2,070	18	8.7
10-14	1,962	29	14.0
15-19	1,789	28	15.6
20-24	1,962	24	12.2
25-29	1,919	20	10.4
30-34	1,789	21	11.7
35-39	1,682	15	8.9
40-44	1,358	13	9.5
45-54	2,221	27	12.2
55-64	1,552	6	3.9
65 and over	991	5	5.0
Total	21,559	214	9.9

* Population of Olean City July 1, 1928, is based on 1920 and 1930 federal censuses.

Among the Olean City residents the typhoid attack rate was relatively low in the age groups under 5 years and 55 years and over, and high in the age groups 10 to 34 years and 45 to 54 years.

The case fatality rate for the patients under 20 years of age was 9.9, for those ages 20 to 44 years 7.8, and those age 45 years and over 15.8. The males under 20 years of age had a fatality rate of 6.7 in comparison with one of 13.0 for the females, and the males age 20 to

44 years a rate of 4.5 to one of 12.2 for the females. The males age 45 years and over on the other hand had a case fatality rate of 27.3 compared with a figure of only 5.0 for the females (Table V).

The mean length of life after the first symptoms of typhoid fever for the 25 patients who died was 29 days. The 12 males lived, on an average, 5 days longer than the 13 females. The shortest period of illness resulting in death was 9 days and the longest 52 days (Table VI).

Laboratory records of 2,497 specimens obtained from 234 Olean typhoid patients during and after their illnesses are shown in Table VII.

The 248 typhoid cases have been classified by laboratory test results. The blood agglutination test was extensively used to confirm the diagnosis. The isolation of the typhoid bacillus from feces and urine was generally attempted only for the purpose of determining carriers. Less than 30 days after the onset of illness the blood Widal was reported positive for 165 individuals and partial for 12 more, but *B. typhosus* was isolated from the feces of only 17 and from the urine of but 3 persons.

In all, the blood widal was positive for 171 individuals, including 22 who had previously had typhoid vaccine, partial for 14 more, including 2 who had received the vaccine, negative for 13, including 2 who recently had been given typhoid vaccine, and not known for 50, of whom 5 died.

The mean length of time after the onset of illness, as stated on the record sheets, that the Widal was discovered to be positive for 149 persons who had never had typhoid vaccine was 13 days. The median was 11 days, the mode 6 days, and the range 2 to 93 days.

For 6 patients without typhoid vaccine the Widal on an average was negative 8.5 days and positive 13 days after the onset of illness; for 8 more the Widal was partial 14 days and positive 17 days after the first symptoms of typhoid fever.

TYPHOID CARRIERS PRESENT BY MONTHS

The duration of the persistence of typhoid bacilli in both the feces and urine or in one or the other has been determined for 211 patients for whom there were release specimens. All the 248 typhoid cases were included except the 25 who died and 12 who lived away from Olean and submitted no release specimens.

Typhoid bacilli were found in the feces or urine of 88 of the 211 persons at some time. The total number of typhoid carriers at the end of the first month after the onset of illness was 78, assuming that

TABLE V

OLEAN TYPHOID CASE FATALITY RATES BY AGE AND SEX

Age Group	Sex	Cases	Deaths	Deaths per 100 Cases
Under 20.....	M	45	3	6.7
	F	46	6	13.0
	M & F	91	9	9.9
20-44.....	M	66	3	4.5
	F	49	6	12.2
	M & F	115	9	7.8
45 and over	M	22	6	27.3
	F	20	1	5.0
	M & F	42	7	15.8
Total.....	M	133	12	9.0
	F	115	13	11.3
	M & F	248	25	10.1

TABLE VI

DURATION OF TYPHOID FEVER FOR 25 DEATHS

Sex	Number of Persons	Days from First Symptoms of Typhoid to Death		
		Mean	Median	Range
Male.....	12	32	31	10-52
Female.....	13	27	26	9-44
Total.....	25	29	27	9-52

TABLE VII

LABORATORY EXAMINATIONS FOR OLEAN TYPHOID CASES

Examination	Persons	Specimens				
		Total	Positive		Partial	
	No.	No.	No.	Per cent	No.	Per cent
Feces.....	217	1,205	535	45	23	11
Urine.....	214	1,042	185	18		
Widal.....	197	217	175	81		
Blood Culture.....	30	30	18	60		
Bile.....	2	3	2	67		
Total.....	234	2,497	915	37	23	11

individuals who were found in later months to be excreting typhoid bacilli did the same earlier. At the close of the third month there were 24 carriers, or 11.4 per cent of the 211 individuals for whom there were release specimens. After 5 months there were no persons who excreted typhoid bacilli in the urine alone.

The number of typhoid carriers at the end of 6 months was 14, or 6.6 per cent of the patients examined, and at the close of 8 months was 12, or 5.7 per cent. The latter 12 have remained typhoid carriers for over 16 months, or as long as tests have been made.

Typhoid bacilli were found in the feces of 63 of the 211 persons at some time. The number of fecal typhoid carriers at the end of the first month after the onset of illness was 55 and at the close of the third month was 20, or 9.5 per cent of the persons examined. After the fifth month the numbers of fecal typhoid carriers were the same as those given in the preceding tabulation for fecal and urinary carriers.

Typhoid bacilli were discovered in the urine of 53 persons. The number of urinary carriers at the end of the first month after the onset of illness was 51 and at the close of the third month was 18, or 8.6 per cent of the 209 individuals for whom there were release specimens. One month later there were 13, or 6.2 per cent. At the termination of 5 months the urinary carriers numbered 9, or 4.3 per cent of the persons examined. The typhoid bacilli were found in the urine of 10 of the 12 chronic fecal typhoid carriers more than 4 months after the first symptoms of typhoid fever.

There were 51 individuals, including 29 males, whose stools contained typhoid bacilli and then became negative. The median number of days after the onset of illness that *B. typhosus* was last present was 44, and first absent for two or more consecutive specimens 51 days. There was no significant sex difference.

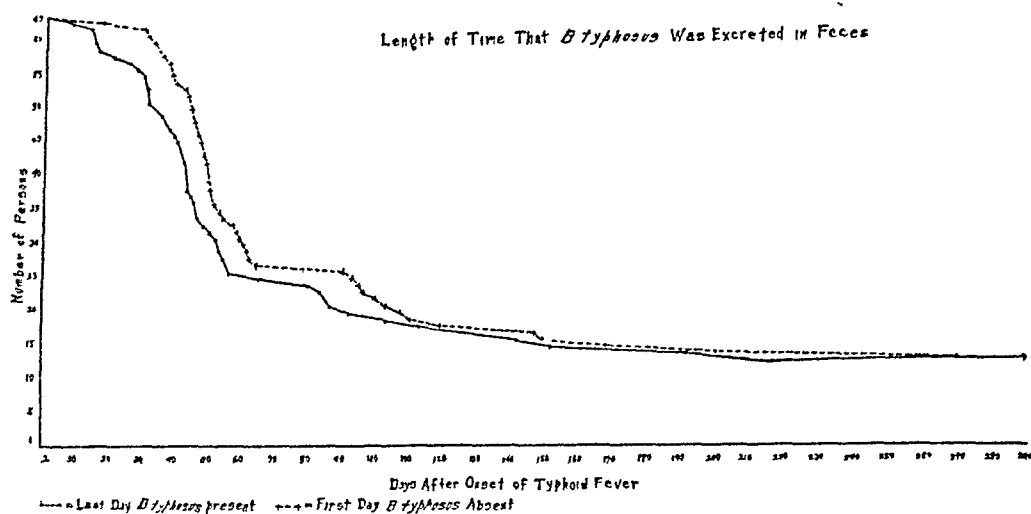
There were 43 persons including 26 males whose urine contained typhoid bacilli and then became negative. The median number of days after the first symptoms of typhoid fever that *B. typhosus* was last present was 50, and first absent on two or more successive occasions was 57 days. The median figures for the males were almost the same as those for the females.

LENGTH OF TIME THAT *B. TYPHOSUS* WAS EXCRETED IN FECES

The graph (Figure IV) depicts the length of time after the first symptoms of typhoid fever that *B. typhosus* was excreted in the feces of 63 persons, including the 12 chronic typhoid carriers.

The graph (Figure V) depicts the length of time after the first

FIGURE IV



symptoms of typhoid fever that *B. typhosus* was excreted in the urine of 53 persons, including 10 chronic urinary carriers.

Typhoid bacilli have been found in fecal specimens from the 12 chronic typhoid carriers in the last specimens examined from 495 to 652 days after the onset of illness. The bacilli have been found in the urine of 10 of the above carriers from 121 to 630 days after the first symptoms of typhoid fever.

FIGURE V

Length of Time That *B. typhosus* Was Excreted in Urine

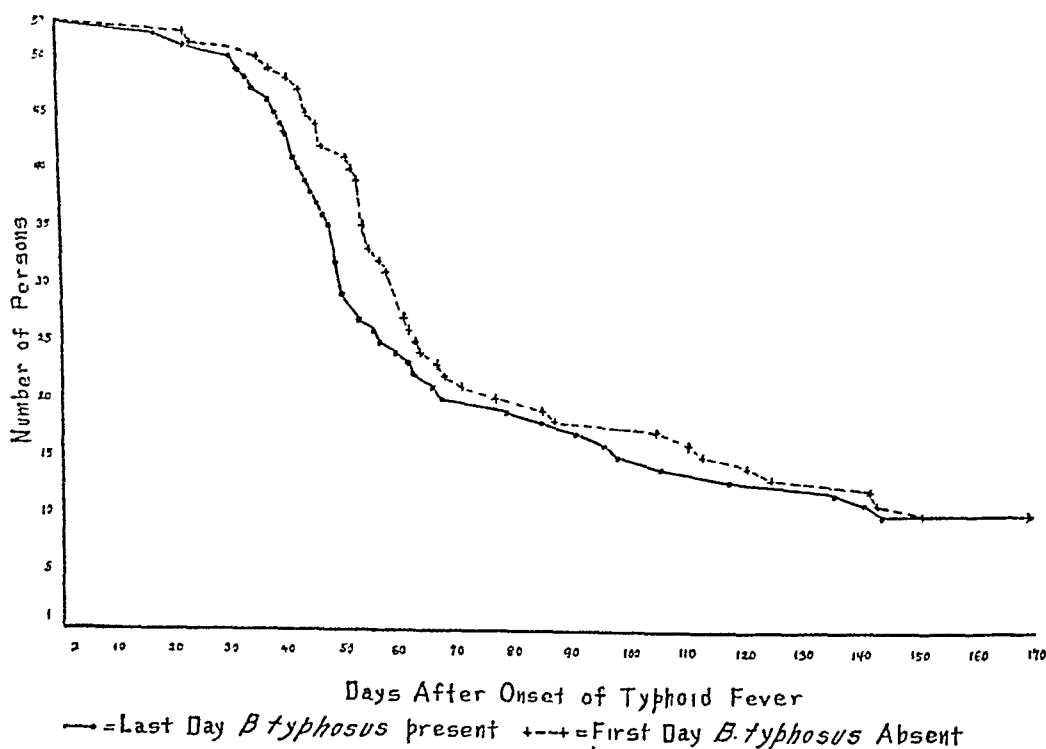


TABLE VIII

LENGTH OF TIME *B. typhosus* WAS EXCRETED BY 12 CHRONIC TYPHOID CARRIERS
REMAINING FROM OLEAN EPIDEMIC

Specimen	Number of Persons	Days After Onset of Typhoid					
		Mean		Median		Range	
		<i>B. typhosus</i>		<i>B. typhosus</i>		<i>B. typhosus</i>	
		First Found	Latest Found	First Found	Latest Found	First Found	Latest Found
Feces.....	12	46	593	48	627	12-79	495-652
Urine.....	10	73	386	70	373	12-169	121-630

The 12 chronic typhoid carriers included 9 married women and 3 married men or three times as many females as males. All the women except one had borne children and that one had symptoms of acute cholecystitis during her illness with typhoid fever. The mean age of the 12 was 44 years, and the range of ages was 27 to 61 years.

Ninety-seven per cent of 391 fecal specimens from the 12 chronic typhoid carriers for a period of at least 16 months after the onset of illness have contained typhoid bacilli.

Urine specimens from 1 male and 1 female typhoid carrier have never contained *B. typhosus*. Thirty-two per cent of 253 urine specimens from the remaining 10 typhoid carriers have shown typhoid bacilli. Some of the urine specimens may have been contaminated by feces. *B. typhosus* was excreted in the urine of the carriers much more intermittently than in the feces.

One of the chronic typhoid carriers who had onset of mild typhoid fever September 28, 1928—diagnosed 2 months later—was probably responsible for 3 cases of typhoid, including 1 death, prior to her dis-

TABLE IX

AGE AND SEX OF 12 OLEAN CHRONIC TYPHOID CARRIERS

Age by Year Groups	Total	Male	Female
All Ages.....	12	3	9
25-34.....	3	0	3
35-44.....	3	2	1
45-54.....	4	1	3
55-64.....	2	0	2
Mean Age.....	44	45	44
Median Age.....	45	44	46
Range of Ages.....	27-61	37-54	27-61

covery and for 2 cases subsequently. (She is one of the 2 carriers who excreted typhoid bacilli in the feces but not in the urine.) Another of the chronic carriers is believed to have given rise to 3 cases of typhoid, including 1 death.

TYPHOID VACCINATION

At city health department and school clinics during the course of the typhoid epidemic 3,990 persons received three inoculations with New York State Department of Health typhoid vaccine, or in a small proportion of cases the mixture of typhoid and paratyphoid A and B vaccine. Physicians in their private practice immunized 671 school children and many other persons.

TABLE X
TYPHOID IMMUNIZATION OF OLEAN SCHOOL CHILDREN

Age in Years	Pupils Number	Pupils Immunized		Days of School Attendance Lost				
		Number	Per cent	Inoc. No. 1	Inoc. No. 2	Inoc. No. 3	Total	
							Number	Per 100 Pupils Immunized
4.....	131	32	24	2.0	1.0	2.0	5.0	15.6
5-9.....	2,213	1,184	54	123.0	108.5	89.0	320.5	27.0
10-14.....	2,219	1,419	64	117.0	183.0	116.0	416.0	29.3
15 & over...	781	516	66	51.0	73.5	65.0	189.5	36.7
Total.....	5,344	3,151	59	293.0	366.0	272.0	931.0	29.5
Total per 100 Pupils Immunized.....				9.3	11.6	8.6	29.5	

Table XI shows the effects of the typhoid immunization of 3,151, or 59 per cent of the Olean school children. The days of attendance lost, per 100 pupils immunized, was 9.3 for the first inoculation, 11.6 for the second, and 8.6 for the third, or a total of 29.5 days. For the three inoculations together the days of school attendance missed per 100 students treated increased from 15.6 at age 4 years to 36.7 at age 15 years and over.

The days of illness due to all three inoculations per 100 pupils immunized was 32.5 of which 13.4 days were due to sore arms, 9.9 to headaches, 8.1 to general reactions, 0.8 to dizziness and 0.3 days to miscellaneous causes. The totals increased from 18.7 days per 100 pupils protected at age 4, to 44.1 days at age 15 years and over. Skin eruptions were noted for 3.1 per cent of the students.

Among the 248 typhoid patients there were 24 who had received

TABLE XI
TYPHOID IMMUNIZATION OF OLEAN SCHOOL CHILDREN

Age in Years	Pupils Immu- nized	Days of Illness Due to Inoculations							Skin Eruptions	
		General Reac- tions	Sore Arm	Head- ache	Dizzi- ness	Misc.	Total		Number Pupils	Per cent. of Pupils Immu- nized
							No.	Per 100 Pupils Im- munized		
4.....	32	1	4	1	0	0	6	18.7	0	0
5-9.....	1,184	91	138	78	9	5	321	27.1	53	4.4
10-14....	1,419	129	177	146	15	4	471	33.1	43	3.0
15 & over.	516	36	105	86	1	0	228	44.1	4	0.7
Total....	3,151	257	424	311	25	9	1,026	32.5	100	3.1
Total per 100 Pupils Immunized		8.1	13.4	9.9	0.8	0.3	32.5			

from one to three inoculations with typhoid vaccine during the progress of the epidemic, and 9 who had obtained three injections from 3 to 11 years previously. The latter number included 2 registered nurses and 5 ex-military men of whom 3 were World War soldiers. The number of cases of typhoid fever among the estimated 1,000 World War veterans in Olean was about one-quarter that per 1,000 males of their age group who were not in that war.

COST OF OLEAN TYPHOID EPIDEMIC

The State Legislature has authorized the City of Olean to issue 25-year bonds to the amount of \$425,000 to pay the cost of the care of the Olean typhoid cases and to settle claims. A committee of seven appointed by the Olean City Council had by September 10, 1930, spent approximately \$370,000 and had about 24 unsettled claims, including those for 1 death and for 5 chronic typhoid carriers, of whom 1 typhoid carrier demands \$75,000. The claims committee has in general allowed all bills for physicians, nurses, hospital expenses, and loss of time of wage earners, and made settlements for deaths in proportion to the number of dependents and the earning capacity of the individual before he had typhoid fever.

If the remaining \$55,000 of the authorized bond issues will satisfy the outstanding claims, the average cost per person who had typhoid fever and lived will be about \$1,550. The range has been from nothing to \$16,556 for a railroad conductor age 49 years who became incapacitated as the result of the complications of typhoid fever. The

average for expenses and settlement per death is about \$3,200, ranging from \$714 for nursing and hospital expenses in the case of a 72-year-old physician to \$11,550 for the death of a 56-year-old railroad crew dispatcher who left a family. The \$425,000 would thus be divided into \$345,000 for the living and \$80,000 for the expenses and claims of heirs of the dead.

The payments have by no means completely compensated the typhoid patients and their families for economic losses sustained. It would be difficult to recompense fully the 12 persons who became chronic typhoid carriers. The state, county, and city health departments, the Red Cross, and other organizations had their expenses increased by the Olean epidemic.

The secretary of the Olean Chamber of Commerce estimates conservatively that the direct loss to Olean business because of the typhoid epidemic was \$200,000. The wholesale bakeries which supplied the surrounding area and the other establishments including hotels, which catered to out-of-town trade, were particularly hard hit by loss in patronage.

The enlargement and improvement of the Olean water filtration and chlorination plant since the typhoid epidemic have cost approximately \$125,000, making the total value of the plant now about \$250,000. Plans are being prepared for an improved sewerage system and a sewage disposal plant.

ACKNOWLEDGMENT

I am indebted to Dr. E. S. Godfrey, Jr., Director of the Division of Communicable Diseases of the New York State Department of Health, for kindly furnishing data and helpful criticism; to Dr. E. K. Kline, Bacteriologist in charge of the Diagnostic Laboratory of Cattaraugus County, for supplying the laboratory records, and to Dr. C. A. Greenleaf, Director of the Cattaraugus County School Hygiene District, for making available his tabulations of the typhoid immunization of the Olean school children.

REFERENCES

1. New York State Department of Health *Forty-ninth Annual Report*, I: 104-112, 1928.
2. Miner, J. R. The Incubation Period of Typhoid Fever, *J. Infect. Dis.*, 31: 296-301 (Sept.), 1922.

Camp Hygiene and Sanitation

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THE present paper is supplementary to the studies embodied in a plan for the hygienic and sanitary classification of summer camps published in 1929.¹ In order to secure accurate data contacts were made with all but 3 State Departments of Health, the U. S. Army, the U. S. Public Health Service, executive departments of the large camp organizations (Boy Scouts, Girl Scouts, Y. M. C. A., Y. W. C. A., Camp Fire Girls, Catholic Summer Camps), the National Safety Council, and certain private camp groups. These lay organizations have devoted much time and effort to the study of various phases of camp life. The tourist camp will be briefly considered as a closely related problem.

The possibilities involved in the maintenance of proper sanitary facilities in camps may be surmised from the following figures. According to the 1929 *Handbook of Summer Camps*² there were 2,737 camps distributed through 35 states. Of these, the most densely populated were: New York (394), Maine (230), Pennsylvania (205), New Hampshire (185), Massachusetts (180), California (150), Michigan (116), Illinois (105), Ohio (103), and Connecticut (97). The greatest concentrations are seen about the lake shores of Maine and central New Hampshire, and the hills and valleys of the White, Green and Adirondack mountains. Of 2,776 camps, including 39 in Canada, approximately half (1,346) are private while the remainder are distributed as follows:

Organization	No. of Camps	Population
Boy Scouts	498	300,000
Girl Scouts ³	323	41,472
Y. M. C. A. ⁴	415	101,165
Camp Fire Girls ⁵	101	57,182
Other organizations	90	Not known

These figures do not include the 200 camps operated by the Y. W. C. A.⁶ at which the 1929 attendance totaled 103,000. It will therefore be seen that the 5 major camp organizations alone controlled a 1929 summer population of 602,819 persons.

The tourist camp problem is intimately bound up with improved road conditions and opening of the national park areas. The latter

approximate 11,304 square miles according to the latest available figures. In 1922 approximately 13 million automobiles were owned by the people of the United States and 2,819,386 miles of highways were certified by the U. S. Bureau of Public Roads as being available for use. Solomon¹ estimates the present number of motor tourist camps at 15,000 with a transient population of 3,150,000, including 1 million juniors.

The most complete studies of tourist camps have been made in Minnesota, Florida and West Virginia. In Minnesota there are 175 camps, 160 of which are owned, loaned or rented by the city or village. During 1926 the West Virginia Department of Health made complete inspections of 110 water supplies and certified only 11 as safe. "Safe Water" markers are now posted along state and federal highways in West Virginia, Ohio, Pennsylvania, Michigan, Missouri and Florida. There are no general statistics available relative to disease incidence in summer camps.² The problem as it concerns the public health worker may be divided into food and insect-borne infections, contagious disease and preventable accidents. Only the first will be considered because of its relative importance. The diseases are chiefly typhoid, paratyphoid and dysentery, with typhoid predominating. I have also encountered outbreaks of gastroenteritis apparently due to some member of the salmonella group and associated with faulty sanitation. The clinical manifestations are much like those of bacillary dysentery. The difficulties encountered in tracing some of these outbreaks may perhaps be exemplified by one instance in which infective material seeped through a small break in an old sewer line into the water supply. Large quantities of methylene blue and chromogenic bacterial suspensions failed to come through. It was finally found necessary to excavate the entire system in order definitely to ascertain the source of contamination.

As the typhoid problem, from a public health standpoint, applies to other intestinal infections it alone will be considered. Typhoid fever outbreaks in summer camps are generally secondary to:

1. *Sanitary Facilities*—Poor sanitary facilities whereby typhoid excreta from in or outside the camp reach a water supply not filtered or chlorinated. This is essentially the problem of the sanitary engineer. The drinking water supply and sewage disposal system are the most important factors in the consideration of any camp site. Without their careful planning and supervision infections of intestinal origin will sooner or later manifest themselves. Casual or periodic water examinations for *B. coli* may do much harm by lending a false sense of security to otherwise solicitous camp directors. The possibility of se-

curing suitable connections with the nearest town having a carefully supervised water supply and sewage disposal system should be considered in the choice of a camp site. In lieu of this, the use of properly constructed septic tanks with after-treatment of the effluent (chlorination or sub-surface irrigation) and of filtered or chlorinated drinking water is always advisable. The use of water from open lakes without further treatment is never devoid of danger. Hikers should carry their drinking water from camp or else boil or chlorinate it en route. Disposal of excreta by burial away from a water supply is largely a matter of education by the camp sanitarian and effectual supervision by the councillor in charge.

2. *Carriers*—The carrier problem is becoming more apparent as the various state departments of health enforce the requirement of negative fecal cultures before the final discharge of a typhoid patient. The number of known carriers will undoubtedly increase. Late in 1929 the New York State Public Health Council amended Chapter 2 of the Sanitary Code providing for such cultural examinations, a procedure which had been in force in New York City for some time. It is quite generally conceded that approximately 5 per cent of all typhoid patients remain carriers for varying periods. The State Health Department records show that many were responsible for cases within 12 months after recovery from the disease. Recently the Health Commissioner of New York City claimed that 40 per cent of the serious outbreaks could be traced to carriers. At the end of 1930 this city carried a list of 301 carriers. At the end of 1927 there were 188 known carriers in New York State exclusive of the city.⁹

As a result of improved epidemiological work 41 additional carriers were discovered in up-state New York during 1929, exceeding by nearly 50 per cent the figures of any previous year.¹⁰ By the end of 1930 the total number had increased to 268, making a total of 569¹¹ for the entire state.

A recent example of the carrier problem is the outbreak which occurred during the summer of 1929 in a Pennsylvania camp, involving 61 people with a mortality of 6 per cent. I had an opportunity of culturing the feces of one of these patients in April, 1930, 7 months after recovery, and found typhoid bacilli, a result previously obtained by the New York City Department of Health. That typhoid has diminished somewhat, but still constitutes a formidable problem, may be seen from the following figures. Typhoid fever cases reported to the U. S. Public Health Service, July to September, inclusive,¹² were: 1928, 12,161; 1929, 10,110; 1930, 11,614.

In an attempt to clarify existing legislative enactments regarding the conduct and supervision of summer camps, inquiries were sent to

the health department of every state. Of 45 from which the required data were received 8 (Georgia, Alabama, Vermont, Iowa, Louisiana, North Dakota, Wyoming, New Mexico) had no regulations specifically governing summer camps. The more complete and stringent regulations were found to exist in the Eastern and New England states where summer camps abound. In most states the general sanitary code would, in a sense, apply to summer camps which might come under the supervision of a local health officer. In actual practice, however, it has been found most feasible to enact specific public health measures. The more detailed provisions for camp surveillance exist in Colorado, Florida (tourist camps), Kentucky, Maine, Massachusetts, Minnesota (tourist camps), Missouri, New Hampshire, New Jersey, New York, North Carolina, North Dakota (tourist camps), Ohio, Oklahoma, Oregon (tourist camps), Rhode Island and Virginia. Vermont has no printed rules and relies entirely upon personal visitation by the sanitary engineer.

Special licensing is necessary in New Hampshire, Illinois, Idaho, Maryland, Nebraska, New York, Ohio and North Dakota. An inspection and rating system is in force in Kansas, Illinois, Maine, New York, North Carolina, Oregon and Michigan. Official State Health Department approval by signs or published lists may be obtained in Colorado, Florida, Kentucky, Michigan, Missouri, Ohio, Oklahoma, Texas and West Virginia.

In general, it may be stated that existing regulations may be divided into those which are:

1. Loosely enforced (advisory)
2. Strictly enforced (compulsory)
 - a. Voluntary regulation by lay organizations
 - b. Enforcement by the State Department of Health

In the first group the provisions of the general sanitary code are rather loosely applied to camps because of their short period of existence each year and the desire to avoid loading them with any great financial burden. The compulsory or strict enforcement group regards camps as communities requiring the same strict sanitary supervision as permanent towns or cities in spite of their short lived existence. Compulsory regulations, however, do not necessarily emanate from state departments of health. Many of the large camp organizations and certain private owners have voluntarily set up regulations which not infrequently, in certain states, exceed the requirements of the local or state health departments. Moreover, these bodies are not so unwieldy and slow to convince as local legislatures. Sanitary problems

are more apt to be quickly recognized and solved. An example may be found in Massachusetts where "surveys of camps and records of contagious disease outbreaks have shown that many camps fall short of reasonable health standards."

In order to secure such standards The State Department of Public Health recently asked for a camp licensing law, which, after being proposed, failed to pass. The large camp organizations, on the other hand, seem to have taken the initiative, having accumulated a voluminous literature and issued such publications as *Camping* (Playground Recreation Association of America). The National Safety Council has also collected an extensive bibliography on "Camp Safety Hygiene and Sanitation" and has issued accident and illness follow-up cards in an endeavor to secure data of value in preventive work. The Y. M. C. A. and others are making similar studies.

REASONS FOR THE PRESENT INADEQUATE SUPERVISION OF SUMMER CAMPS

A critical study of existing regulations as promulgated by the various state departments of health suggests the following reasons for the present unsatisfactory state of summer camp supervision:

1. While there is a general recognition of widely accepted public health measures there is some divergence of opinion as to their radical enforcement in the case of summer camps.

2. Efficient and capable state departments of health are frequently hampered by lack of funds. Preventive public health work rarely receives the same monetary support as emergency epidemiological investigations, though the latter are largely the result of the inadequacy of the former. The per capita assessment to cover a state health department budget does not generally take into account the great influx of campers from other states. Young public health recruits are discouraged by the relatively poor compensation for their services.

3. The good work of a health department in one state may be seriously hampered or nullified by the laxity of a similar body in a neighboring state.

4. The lack of accurate data with regard to disease incidence in summer camps.

5. Public health regulations have been outstripped by the rapid growth of the camp movement, shown by the incomplete figures of the Y. M. C. A.:

Year	No. of Camps	Attendance
1900	20	Not known
1926	421	32,213
1929	—	101,165

6. Commercial and political impediments. The desirability of having large camp groups in certain states has not infrequently involved the letting down of customary public health barriers.

SUGGESTIONS FOR ELEVATING CAMP STANDARDS

1. The creation of a central advisory board consisting of a representative each

of the U. S. Public Health Service, U. S. Army, state departments of health, large organized camp groups and private groups. The function of this board would be to collect accurate epidemiological data (e.g., known typhoid carriers), to draw up uniform hygienic and sanitary standards and stress the approval of camps meeting these standards.

2. The more rigid enforcement of existing sanitary regulations by state departments of health.

3. The attitude of state departments of health toward existing camps to be advisory and constructive but without compromise as to accepted sanitary standards.

4. Adequate budget for state departments of health in order to enable these bodies to augment their forces for summer camp work. Personnel may consist of undergraduate public health workers under the supervision of competent, experienced directors. Employment of qualified public health nurses and other professionally trained persons whose occupations permit their accepting summer positions.

5. A resident graduate medical attendant trained in the principles of public health work in or near each camp.

6. Educational campaign among children and adults for 1 month preceding the summer vacation period. Wide dissemination of knowledge concerning summer typhoid and other communicable diseases as well as preventable accidents, through teachers, schools, camp organizations, health department bulletins and lay periodicals.

7. Placarding of all safe drinking and bathing waters, roadside eating places in summer camps and along the main highways.

8. Local purchases of camp food from approved sources.

9. Enforcement of two negative fecal cultures, one urine culture and a Widal for every food handler.

10. Stressing of typhoid prevention work as much as vaccination against smallpox. (I have had several opportunities to note the occurrence of typhoid in recently vaccinated boys who, feeling secure, drank water promiscuously on their daily hikes.)

11. Accurate records, in duplicate, containing the names and addresses of all campers and visitors in order to trace contacts.

12. Minimal toilet seat capacity of one toilet seat per 15 people. The lack of suitable toilet facilities is a rather common cause for the indiscriminate soiling of camp grounds, with its inherent dangers. The laxity in this regard may be illustrated by the requirements of certain states:

State	One seat per			
Maine	15	persons	or	fraction
Connecticut	15	"	"	"
Massachusetts	15	"	"	"
Oregon	25	"	"	"
Washington	50	"	"	"
Oklahoma	15	"	"	"

13. The annual certification and licensing of camps, with revocation at any time for cause.

14. Weekly unannounced inspections with prompt closing after suitable warning of camps falling below accepted standards rather than the repeated publication of approved camp lists or more stringent legislation.

15. Centralization of camp approval in state departments of health rather than by local health officers except where experience and laboratory facilities are adequate.

REFERENCES

1. Felsen, J. A System of Classification of Summer Camps, *J. A. M. A.*, 92: 1789 (May 25), 1929.
2. Sargent, P. Editor *Handbook of Summer Camps*, p. 799.
3. Rippen, Jane. Personal communication.
4. Cotton, Arthur N. *Report*, National Council, Y. M. C. A., 1929.
5. Scott, Lester F. Personal communication.
6. Ferris, M. C. Personal communication.
7. Solomon, B. Editor *Camp Life*. Personal communication.
8. Williams, R. C. Personal communication.
9. *Health News*, New York State Dept. of Health, 5: 8 (Feb. 20), 1928.
10. *Health News*, 7: 13 (Mar. 31), 1930.
11. Coughlin, F. E. New York State Dept. of Health. Personal communication.
12. Williams, R. C. Personal communication.

ADDENDUM

Figures received since this article went to press are as follows:

In 1930 the Girl Scout Camps numbered 544 with a population of 48,077 (Johnson, K. L.); Boy Scout Council Camps numbered 614, which, in conjunction with miscellaneous camps, controlled a population of 320,000 (Wessel, W. C.).

In February, 1931, the National Park areas comprised 16,263 square miles, including 3,741 square miles of National Monuments (Demara, A. E.). In 1929 there were 23,121,589 passenger automobiles registered in the United States and 3,024,233 miles of road available for use, including 314,136 miles of state highways (Fairbank, H. S.).

The Inner Reservoir

“THE ability to make the best use of leisure,” said Dr. Kenworthy, who is one of the country’s leading woman psychiatrists, “is a good test of a person’s adjustment to life. Many individuals find satisfaction in their work, but in their moments of leisure they become restless and uneasy because they have no interests to turn to that will provide the same fundamental release which they derive from their work.

“They are unable to live with themselves, as it were, too fearful to be alone with their own thoughts and, oppressed by a sense of emptiness, they turn to others for relief. They are unable to use their free time as an opportunity for creative self-expression, but only to satisfy a demand for security that is not available within themselves. Their pleasures are therefore mere ways of escape to which they are forced by the lack of adequate personal integration and of the necessary inner adaptation.”—Marion E. Kenworthy, Speech, January 14, 1931, before American Woman’s Association, *Mental Hygiene Bull.*, Jan.–Feb., 1931.

EDITORIAL SECTION

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TO THE MEMBERS OF THE AMERICAN PUBLIC HEALTH ASSOCIATION:

IT is my pleasure to report to you what I consider the most important event that has transpired in the American Public Health Association in recent years.

I refer to the appointment by the Executive Board of Dr. Kendall Emerson as Acting Executive Secretary. Those of us who have been close to the affairs of the Association count ourselves fortunate that we have been able to obtain the service of a man who has behind him such a brilliant administrative record to manage the business of the Association.

A full account of Dr. Emerson's achievements is recorded in the accompanying editorial. To many of the members of the American Public Health Association he needs no introduction. They already count him a friend. Those who do not know him will hold him in as high esteem, as they encounter his personality, his ideas and his ideals.

Dr. Emerson brings a wealth of seasoned judgment and experience to the problems of the Association. I believe, as does every member of the Executive Board, that he is eminently fitted to carry its best traditions to a new and high goal.



President

DR. KENDALL EMERSON APPOINTED ACTING EXECUTIVE SECRETARY OF THE A. P. H. A.

THE National Health Council, an affiliation of national health agencies, at the request of the Executive Board of the American Public Health Association, has arranged with the National Tuberculosis Association to make available a part of the time of its Managing Director, Kendall Emerson, M.D., to serve as Acting Executive Secretary of the American Public Health Association.

It is believed by the groups concerned that this is a valuable experiment in economy of administrative operation of two national health organizations.

While the plan is of a temporary nature, marked sympathy and interest have been expressed by public health leaders in these organizations, whose aims and objectives are so closely related. The plan contemplates the continuance of full independence and autonomy of each association.

Dr. Emerson was graduated from Harvard University Medical School in 1901, and served his internship at the Massachusetts General Hospital. He later engaged in general practice in Worcester, Mass., and in 1903 became a member of the staff of the Memorial Hospital there, as chief of the Surgical Service. He is a member of the American College of Surgeons.

In 1916 Dr. Emerson went to France as a major in the Royal Army Medical Corps. He served later in the American Army, and after the Armistice became attached to the American Red Cross, serving in Siberia and later in Washington. From 1919 to 1921 in Paris he was Deputy Commissioner and Director of the Medical Service for Europe during the commissionership of Robert E. Olds.

In 1926 he was elected president of the Massachusetts Tuberculosis League and a director of the National Tuberculosis Association. He was elected Managing Director of the National Tuberculosis Association, in New York, in 1928.

Dr. Emerson's services with the American Public Health Association begin April 1.



KENDALL EMERSON, M.D.

STUDENT HEALTH

AT the last meeting of the American Student Health Association held in New York, December 29 and 30, 1930, a set of resolutions covering the whole field of college hygiene and student health was adopted. These resolutions grew out of the desire of the President, Dr. Warren Forsythe, to crystallize out of the association's experience that which could be considered of proven value in college hygiene teaching and student health service practice.

The document proposes in the first place that it is a fundamental objective of higher education to develop the ability of the individual to live a more useful, effective and happy life, and since health (emotional and physical) is one of the greatest factors in the realization of this objective it is a major responsibility of every college and university to carry on a program which will develop and protect the health of the student and educate him in scientific health conservation.

The program is divided into:

1. Instruction in and development of physical and mental health
2. The supervision of the care of individual student health and illness
3. The sanitation of student environment
4. The study of health problems

In the first division of the program it is resolved that instruction should aim to analyze and present scientific information relative to the production, maintenance and improvement of health, with the applications of that information for the health benefit of the individual, his family, and of his society. Further this instruction should aim at developing in the student a discriminating scientific attitude for: (1) the selection and wise use of competent, trustworthy health advisers and skillful, dependable health service; (2) the sifting of health literature, avoiding the hazardous and identifying the scientific and appropriate; (3) differentiating between reliable scientific public health organizations and those that are unsafe; (4) the understanding and regulation of his own health habits. It is further recommended that the teaching of hygiene be under the direction of qualified members of the faculty adequately trained in medicine and public health, and that students receive academic credit for these courses on the same basis as in other curricular subjects.

The native health material occurring in chemistry, psychology, biology and other similar courses should be utilized and emphasized in its appropriate setting. Supervision of the care of student health and illness should be in the hands of a physician who is a full graduate in

medicine and properly licensed to practise in his community. He should also be included in the general faculty administrative agency of the college or university.

There should be complete examinations of all entering students followed by personal health conferences of an educational character and a special endeavor should be made to have all remedial defects corrected. The annual health examination of all students is advised, in which emphasis is placed upon confidential discussion of personal health and emotional problems. Evidence of immunity to smallpox should be one of the requirements for admission and no student should be permitted to remain in school who proves to be a health menace to other students or who refuses to coöperate in the health program of the institution.

It is further resolved that the college should conduct a student clinic for the diagnosis and treatment of all ambulatory cases and provide for hospitalization of all cases which need that service. This service should be supported by health fees payable at annual enrollment and individual visits should not involve the payment of a fee. Each visit to the student clinic should be considered as a lesson in proper methods of procedure in scientific medical practice, and as an opportunity for personal instruction in preventive medicine including mental hygiene. When possible a physician with mental hygiene training or a psychiatrist should be attached to the Health Service staff.

Isolation facilities should be available for all contagious diseases and early isolation of merely suspicious cases should be freely practised. Communicable diseases should be controlled through careful observation of all known contacts, and artificial immunization used when possible. Much of the future progress in preventive medicine lies in the results of the study of so-called pre-clinical illness and the health service should keep clearly in mind its unique opportunity and its responsibility for research in this field. The health service should supervise the sanitary inspection of the premises, buildings, swimming pools, water and milk, and food supplies. All food handlers should be required to submit to annual physical examination. Dietary policies of institution should receive the attention of the health service.

In view of the fact that at the present time several agencies such as department of hygiene, department of physical education, student health service, athletics, etc., each asserts itself as being importantly interested in the health of the college student, it is resolved that there be conducted a careful study of what should be termed specific health activities.

The last resolution calls upon college presidents in rural communities to promote and coöperate with the county health unit under the direction of a full-time medical officer as the most effective method of advancing public health practice in their communities.

The committee consisted of the following: Dr. Anna M. Gove, North Carolina College for Women; Dr. Joseph E. Raycroft, Princeton University; Dr. Dean F. Smiley, Cornell University; Dr. T. A. Storey, Stanford University; Dr. John Sundwall, University of Michigan; and Dr. R. W. Bradshaw, Oberlin College, *Chairman*.

ROCKY MOUNTAIN SPOTTED FEVER DISCOVERED IN EASTERN STATES

ROCKY MOUNTAIN spotted fever has been discovered in the East, it was announced February 27 by the U. S. Public Health Service.

A number of cases of this highly fatal disease have been found in Virginia, Maryland, Delaware, North Carolina and Pennsylvania. At first these were thought to be severe cases of endemic typhus fever but after much experimentation by scientists of the National Institute of Health, they were identified as a disease "clinically indistinguishable from Rocky Mountain spotted fever."

An indication of the possibility of Rocky Mountain spotted fever spreading from its locale and invading other parts of the country was expressed last December in the 1930 annual report of the Service in which it was declared that the disease can be spread not only by specific ticks in the Northwest but also by a certain type of tick which infests dogs, cattle, and a number of rodents which are common throughout the entire country.

Rocky Mountain spotted fever is a very virulent disease, the Service explained, since 60 to 80 per cent of those attacked usually die.

Sixtieth Annual Meeting
Montreal, September 14--17
HEADQUARTERS, WINDSOR HOTEL

ASSOCIATION NEWS

DR. SAMUEL H. DURGIN

1839-1931

DR. SAMUEL H. DURGIN, former chairman of the Boston Board of Health and a surgeon with the Massachusetts cavalry in the Civil War, died at his home in Allston, Mass., on March 6.

Born in Parsonfield, Me., July 26, 1839, he attended Dartmouth College and the Harvard Medical School. Graduating from the latter in 1864 he saw service as an assistant surgeon at Richmond and Petersburg and was present on the field when Lee surrendered.

When he returned to Boston in 1865, he entered into the practice of medicine. In February, 1867, he was appointed Resident Physician for the City Institutions situated in the Harbor and was also made Port Physician. In January, 1873, he resigned this position, having been elected a member of the newly formed Board of Health for the City of Boston and soon after was made Chairman, serving as such until he was retired in 1912.

At the time the Board of Health was established, metropolitan Boston had no drainage system and for years Dr. Durgin fought against determined opposition for the establishment of adequate sewage disposal. He finally won this cause and as a result the metropolitan area of Boston was given what was at that time the most up-to-date sewage disposal system in the country.

Soon after the discovery of diphtheria antitoxin by von Behring in 1894, a plant for its manufacture was started by Dr. Durgin at the quarantine station on Gallup's Island with Dr. Harold C. Ernst, Professor of Bacteriology at

Harvard Medical School, as the director. This was continued until the serum was available from other sources.



SAMUEL H. DURGIN, M.D.

Dr. Durgin was one of the first in the country to inaugurate the requirement of two consecutive negative cultures for release of a case of diphtheria, the second culture taken at least 24 hours after the first and by a medical representative of the department. Dr. Durgin was the inventor of the wooden tongue depressor now so widely used throughout the civilized world.

From 1884 to 1909 he was a lecturer on hygiene in the Harvard Medical

School. He was trustee of the Floating Hospital for many years and was actively interested in its work. Dr. Durgin was president of the American Public Health Association in 1893. He became a member of the Association in 1875, was made an honorary member in 1916, and an Honorary Fellow in 1922. He was the oldest member of the Association.

NEW FIELD DIRECTOR OF THE COMMITTEE ON ADMINISTRATIVE PRACTICE

CARL E. BUCK, Dr.P.H., formerly Deputy Commissioner, Executive Officer, and Secretary, of the Detroit Department of Health, has been appointed Field Director of the Committee on Administrative Practice of the American Public Health Association. He succeeds W. F. Walker, Dr.P.H., who resigned, as of April 1, to go with the Commonwealth Fund as Director of the Division of Public Health Studies. Dr. Walker has been with the Association since 1925.

Dr. Buck was a member of the American Sanitary Commission to the Balkan States in 1915 during the typhus fever outbreak in Serbia. He was Health Commissioner of Oak Park, Ill., 1916-1917. He served in the Air Service of the U. S. Army during the World War. After the war he was a member of the staff of the International Health Board of the Rockefeller Foundation, doing malaria work in the southern states. At the time Dr. Kiefer was made State Health Officer of Michigan Dr. Buck was loaned by the Detroit Department to the State Department as administrative assistant. He was president of the Michigan Public Health Association, an affiliation of the A. P. H. A., in 1929.

Dr. Buck's work with the A. P. H. A. begins April 1.

WESTERN BRANCH, AMERICAN PUBLIC HEALTH ASSOCIATION

THE Seattle meeting will be May 28-30. An excellent program is being planned. Medical economics in relation to public health will receive a prominent place on the program. Infantile paralysis, which may be expected in the Pacific Coast and intermountain states this coming summer, will receive considerable attention. California's experience with the extensive use of convalescent serum will be described.

Public health education from the standpoint of the general public, public health nurse, medical social worker, and the medical student, will be one of the leading symposiums.

Public health nursing will be given a prominent place under the leadership of Elnora Thomson and Elizabeth Soule, both of the Pacific Northwest. Sanitary engineering, food control, and sanitary inspection will all have places on the program.

DEATH OF THOMAS F. KENNEY

THOMAS F. KENNEY, M.D., Director of Public Health in Worcester, Mass., since 1919, died March 15 at the Peter Brigham Hospital, Boston. Dr. Kenney was recognized throughout the country as a leader in the field of public health. For several years he has given a special lecture course in health subjects at the Massachusetts Institute of Technology. He was the Health Officers Section representative on the Committee on Training and Personnel of the A. P. H. A. He has been a member since 1918, and a Fellow since 1922.

ON April 6, the American Public Health Association, with other members of the National Health Council, will move its executive offices to 450 Seventh Avenue.

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Survey of Use of Preventive Medical Services for Preschool Children

—The study pertains wholly to preschool children, those under 6 years of age, and involves 140,000 children in 146 cities and 37,000 in the rural sections of 42 states. Information was sought with regard to the application of four preventive measures: (1) Health Examination, (2) Dental Health Examination, (3) Vaccination against Smallpox, (4) Immunization against Diphtheria.

The survey information was collected by local health workers who followed a prescribed method of questioning parents, and the results are comparable just in so far as such instructions were followed. The health examination meant a visit to a doctor to see how the child was getting along even though he were not sick. In like fashion the dental examination meant a visit to the dentist not because of a toothache but just to have the teeth looked over with a view to preventing trouble.

Districts to be surveyed in the cities were chosen around the public schools as a center with the view of securing a cross-section of the various economic groups in the population, there being established for this purpose five such groups. The selections were made by the committee so as to give a very fair cross-section of the population. The rural data were obtained from families living in the open country or from communities under 2,500 population.

How many children under 6 years of age have had a health examination? The leading cities are: Berkeley, Calif., with 82 per cent; Providence, R. I., 76;

Lakewood, O., 75; Utica, N. Y., 73; Cleveland Heights, O., 72. For the average United States city 48 per cent of the preschool children have had a health examination.

At what age are the health examinations given? Compilation of statistics from cities indicates that for infants under 1 year of age, 57 per cent have been examined; for the 1-year group, 54; for the 2-year olds, 50; for the 3d year, 48; 4th year, 48; and 5th year, 52. The inference to be drawn from these figures is that there are practically no health examinations after the 1st year. The figure of 52 in the 5th year means that 52 per cent of the children 5 years of age, some time in their lives, have had a health examination. This does not mean just during the 5th year, but at any time up to and including the 5th year.

Although the difference is not great, the highest economic group in the community has been better served, the lowest having received the poorest service, only 43 per cent having been examined in comparison with 62 per cent for the highest economic group.

In the average United States city, 10 per cent of the preschool children have had a dental health examination. The leading cities were: Cleveland Heights, O., 46 per cent; Newton, Mass., 42; Kansas City, Mo., 34; Berkeley, Calif., 33; Salt Lake City, Utah, 29. Among the relatively well-to-do, about 1 child in 5 has had a dental health examination while in the poorest economic group only 1 in 25 has had such examination. In general, it may be said that dental attention is not commonly sought and

there is apparently little of this work being done for the poorer children.

For the average American city, 14 per cent of the preschool children have been vaccinated against smallpox. In New York City there have been vaccinated 48 per cent; Yonkers, N. Y., 47; Providence, R. I., 40; San Francisco, Calif., 36; and New Haven, Conn., 35.

In the average United States city, 15 per cent of the preschool children have been immunized against diphtheria, the greatest progress at the time of the survey having been made in Niagara Falls, N. Y., with 50 per cent; Syracuse, N. Y., 49; New Haven, Conn., 46; Yonkers, N. Y., 46; and Utica, N. Y., 45. The children of the higher economic groups are receiving the most immunization although the situation varies considerably in individual cities. For example, in Des Moines, Ia., 31 per cent of the highest economic group are protected and only 3 per cent of the lowest, while in Boston, Mass., but 14 per cent of the highest economic group and 29 per cent of the lowest are immunized, indicating, it is believed, that the public clinics are very active in Boston while the private practitioners are doing very little. The contrary is apparently true in Des Moines. Detroit seems to present a picture in which all economic groups are receiving about the same attention. For the highest group, 43 per

cent have been immunized; the second, 30 per cent; the third, 42 per cent; the fourth, 37 per cent; while in the fifth or lowest economic group, 42 per cent have been immunized. This is of interest in showing what happens in a city where the health department has given up all free clinics and where all preventive work is done by the general practitioner and the educational program is carried on by the department of health. Among the 36 largest cities, Detroit stands second in percentage of children immunized at the time of the survey, Detroit having 40 per cent and Rochester, N. Y., 43 per cent immunized. In Detroit, all of this work has been done by the coöperating physicians and none by the Health Department, which organization has, of course, carried on the educational and propaganda work.*

In arranging the cities in sequence from the highest percentage to the lowest in each of the four health measures, a composite rating has been obtained which places in the lead Cleveland Heights, O., followed by San Francisco, Calif., Berkeley, Calif., Kansas City, Mo., and East Orange, N. J.—George T. Palmer, presentation before the White House Conference on Child Health and Protection, February 19, 1931.

* Since this survey was made in September, 1930, the percentage of preschool children immunized in Detroit has been increased to 55.

LABORATORY

JOHN F. NORTON, PH.D.

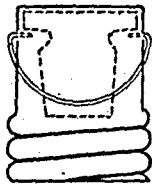
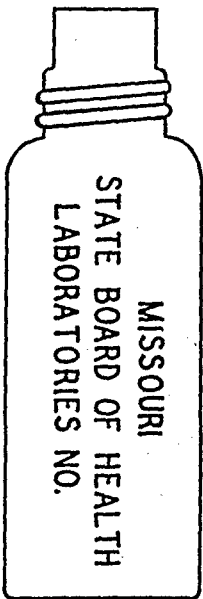
AN IMPROVED WATER SAMPLE BOTTLE

ROSS L. LAYBOURN, F. A. P. H. A.

State Board of Health Laboratories, Jefferson City, Mo.

THE collection of water specimens for bacteriological analysis by untrained persons is never desirable, yet many situations arise in state work in which, from the standpoint of expediency at least, it seems desirable to accept such specimens. One of the common causes of misleading results under such conditions is the contamination of the stopper of the sample bottle during the collection of the specimen. In an attempt to reduce the possibility of the contamination of bottle stoppers to the minimum, the device shown in the accompanying illustrations was perfected in the Laboratories of the State Board

Glass stoppered, metal capped bottles of a type which can be purchased from physicians' supply houses are used. Two holes are drilled in the metal cap in which the ends of a clip of spring



of Health of Missouri several years ago, and has been found to possess sufficient merit to justify the additional expense involved in its use.

brass wire are inserted. This clip retains the glass stopper well within the metal cap where it is not easily subjected to contamination even if the cap is placed on some object during the collection of the specimen. This arrange-

ment has the additional advantage of making it unnecessary to place a strip of paper between the stopper and the neck of the bottle to avoid breakage during sterilization. In preparing these bottles for sterilization, the caps are simply placed loosely on the neck of the bottle and are screwed down tight after removal from the sterilizer.

The glass used in the standard commercial bottle etches quite rapidly under repeated sterilization and soon presents

a very unattractive appearance, and these bottles are also much in demand as replacements in medicine cases. To overcome these disadvantages, a bottle manufacturer is now supplying a bottle of a better grade of glass which withstands repeated sterilization and, as this bottle has the name of the laboratory blown into the glass and does not have the flat side necessary for use in medicine cases, distribution losses are largely eliminated.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Unsuspected Physical Defects—The Heart Council of Cincinnati has reported the second of a series of studies on the physical status of persons engaged in certain kinds of work. The objective was to determine the extent of diseases of the heart and vascular system. The second report embraces the examination of 1,000 white, male, machine and hand tool operators. The report is mainly a series of tables, from which one is left to draw one's own conclusions.

It was found that 87.1 per cent of the group of 1,000 had been vaccinated in some way; 80.2 per cent of them had been vaccinated against smallpox, 22.5 per cent against typhoid, and 21.9 per cent against diphtheria; only 67 per cent of the workers were considered to be on an adequate diet; 56.3 per cent of them had no illness within the last 10 years.

The cardiovascular lesions noted were indeed numerous. The 45.8 per cent in whom such lesions were found did not include observations of such unproved significance as extrasystoles, trivial hypertrophies and arrhythmias. Those, however, whose lesions were considered

significant constituted 31 per cent of the group. The importance of early infections on the heart in later years is shown by the fact that 21.9 per cent of those who had significant heart lesions have a history of illness in the past from some of the common infectious diseases.

A relation between excessive weight and myocardial hypertrophy is indicated by the fact that 49.3 per cent of those who were 20 pounds or more above normal weight had myocardial hypertrophy, while only 5.3 per cent of those who were 20 pounds or more underweight had any cardiac lesion. Of the whole group of 1,000 machine and hand tool operators, 83.6 per cent had significant defects of some kind and 88.5 per cent had defects unknown to them or of which they had not complained.—*J. A. M. A.*, 96: 119–120 (Jan. 10), 1931.

What is a Stillbirth?—An investigation into the many different definitions of stillbirth and into the laws and religious customs attended with the recording of births as live or stillbirths in the different countries and states of the United States indicates that the discrepancies are so great as to render

comparative statistics on stillbirth and infant mortality practically valueless.

In the Province of Quebec (as in some other localities throughout the world) where there is a preponderance of the Roman Catholic faith, there is a tendency, whenever there is a doubt that a new-born child is born alive or not, to report it as a live birth to give the child the benefit of baptism. As a consequence the stillbirth rate in Quebec is lower and the infant mortality rate higher proportionately than in Protestant communities.

In Canada, the age at which a fetus is considered as a live or stillbirth varies: in Manitoba at 5 months; Alberta at 24 weeks; Quebec and Saskatchewan at 6 months; British Columbia at 28 weeks; Prince Edward Island, New Brunswick and Ontario at 7 months. In all the nine provinces there is variance as to what is considered an evidence of life in a new-born fetus or child.

The annual collection of stillbirth statistics in the United States was begun in 1922. The interpretation of these statistics must necessarily be governed by the differing regulations of the states for the period of uterogestation to which a stillborn child must have advanced before a certificate is required to be registered. In 18 states, registration is required after 4 full months, in 2 after 4½, in 3 after 5, in 3 after 6, in 2 after 28 weeks, in 3 after 7 months; in New Hampshire and Delaware there is no definite rule; and in Maryland any product of human gestation that may be recognized as such must be registered.

In Austria the law prescribes that all children who, being born dead, have reached a state of development which indicated the possibility of independent existence, are to be registered; but that all others, which means non-viable children, are to be regarded as abortions or miscarriages and registration of such

births is not required. It is remarked that in Roman Catholic districts, still-born children are baptized, and as registration of birth is made by the religious communities, registration of some stillbirths is made as live births, rendering the stillbirths statistics inaccurate.

In Spain, registration of all stillbirths is compulsory since 1919. Registration which includes those born without signs of life, and those born alive but dying within 24 hours after the severance of the umbilical cord, must be effected within 24 hours of the occurrence of such birth.

In the Republic of Portugal a special register is kept for stillbirth but no definition of live or stillbirth is given. In Belgium, officially a stillbirth is defined as the birth of a dead child after the 180th day of gestation. In Holland, the procedure is quite similar to that followed in Belgium with the exception that no mention is made of the period of uterine gestation. In Denmark, a footnote on the birth certificate gives the following definition of a stillbirth:

Premature born children, born alive, to be recorded as live births. And a fetus born without obvious signs of life in the 29th week of pregnancy or after should be recorded as a stillbirth; but if born before the 29th week it should be deemed a miscarriage and not recorded.

In Norway, stillbirths are defined as births without life after the 28th week of pregnancy. Abortion and stillborn fetuses born before the end of the 28th week are not to be registered. In England and Wales, no record of stillborn children may be made in a register of births and deaths. But, if a child is born alive, it matters not how soon it may die, both the birth and the death must be registered. A child is deemed to be stillborn when, after being completely born, it has not breathed or shown any sign of life. The term completely born is understood to indicate

complete expulsion from the body of the mother, independently of complete separation. No mention is made of the product of miscarriage or abortion, and it seems that whenever a child is born alive according to the above definition whatever be its fetal age, a live birth is registered.—Eugene Gagnon, *Canad. Pub. Health J.*, 22: 16–27 (Jan.), 1931.

Statistics for Northern Ireland—The latest enumerated population of Northern Ireland, obtained for the Census of 1926, is 1,256,561. The estimated population in the middle of 1929 is 1,246,000, including military. The results of the year's registration show that a further increase in the marriage rate has been accompanied by a further decrease in the birth rate, and that for the first time since 1924 the death rate has increased.

Births registered during the year numbered 25,410, a decrease of 553, or 2.1 per cent, as compared with the previous year. The birth rate was 20.4 per 1,000 of the estimated population, being 0.4 below the rate for the previous year and 2.4 lower than the average rate for the 10 years 1919–1928. The proportion of male births to every 100 female births was 105.5. Deaths registered during the year numbered 19,822, an increase of 1,818 or 10.1 per cent, as compared with the previous year. The death rate was 15.9 per 1,000 of the estimated population, being 1.5 above the rate for 1928 and 0.2 above the rate for the previous ten years 1919–1928. The relatively high death rate of 15.9 per 1,000 in 1929 is due mainly to a large increase in the number of deaths from influenza, bronchitis and pneumonia, as a result of an epidemic in the first quarter of the year.

The influenza epidemic had the effect of increasing the death rate from this disease to 107.1 per 100,000 of the population, compared with an average

rate of 59.4 for the years 1919–1928. Deaths from all forms of tuberculosis show a decrease of 7.7 per cent on the number registered in the year 1928, the death rate being 129.3 per 100,000 in 1929, and 139.6 in 1928, while the average for the last 10 years preceding 1929 was 169.0. Cancer has shown an increase every year since 1922, with the exception of 1926 and 1928, when slight decreases were recorded. In 1929 the mortality rate was 117.9 per 100,000. Puerperal mortality in 1929 was 6.26 per 1,000 births as compared with the previous 10 years' average rate of 6.18.

Deaths of infants under 1 year of age numbered 2,174, or 86 per 1,000 births registered, as compared with 78 per 1,000 in 1928, and an average of 84 per 1,000 for the 10 years preceding. In 1929 and 1928 the rates for deaths of infants under 1 year of age were 74 and 65 per 1,000 births, respectively, for England and Wales, 87 and 86 for Scotland, and 70 and 68 for the Irish Free State.—*The Registrar-General's Eighth Annual Report*, Government of Northern Ireland, pp. 6–24, 1929.

The Extent of Gonorrhea and Syphilis in the United States—A series of prevalence studies has been carried out in communities with a total population of more than 17,758,000 located in various parts of the United States, and representative of the population as a whole. It is estimated that there are in the whole country 643,000 cases of syphilis and 474,000 cases of gonorrhea constantly under medical care. Twenty-one per cent of the cases of gonorrhea and 40 per cent of the cases of syphilis are treated in public clinics.

The combined case rate for gonorrhea and syphilis for the male population was nearly twice as high as that of the female, the rates being 9.65 and 4.85 per 1,000, respectively. This difference

was more pronounced for gonorrhea than for syphilis.

Venereal diseases as a group far outnumber all other reported infections except influenza in times of an epidemic. The experience in the military forces of this and other countries in peace and in war time shows the venereal diseases to exceed any other condition as a cause of noneffectiveness. Among the second million men drafted during the World War, 56.7 per 1,000 were found by a casual clinical examination to have a venereal disease.

It is estimated that in the continental United States there are 423,000 new cases of syphilis which seek treatment during the early stage (the first year) of the disease, and, likewise, 679,000 new cases of gonorrhea each year which come under medical care during the first three months of the infection. This incidence represents an annual attack rate per 1,000 population of 3.46 for syphilis and 5.71 for gonorrhea. Par-ran and Usilton (*J. Soc. Hyg.*, 16: 31, 1930), estimating 643,000 cases of syphilis and 474,000 cases of gonorrhea constantly under medical care in the United States, give case rates for gonorrhea 4.88 for males and 1.78 for females; for syphilis 4.77 for males and 3.08 for females.

Approximately 31 per cent of the total cases of venereal diseases under treatment are found among presumably indigent persons, inasmuch as this percentage of total cases were being treated at public expense in clinics, hospitals or other institutions. The peak-age group for the onset of both gonorrhea and syphilis has been determined as 20 to 25 years.

A greater prevalence of venereal disease exists among the negroes than among the white population, the rate per 1,000 being 8 for white and 11 for colored population. A recent study of the rural negro in a southern state indicated that as high as 24 per cent of the

entire population of more than 1 year of age showed a positive Wassermann reaction.

The results of a number of published reports over a 10-year period indicated that of women admitted to maternity hospitals 6.9 per cent had a positive Wassermann reaction. General paralysis contributes 4 per cent of the population of our insane institutions. Syphilis stands first or second among the most frequently reported infections to the U. S. Public Health Service from the state health departments. Gonorrhea stands about fifth.

Among the general male population between the ages of 15 and 45 years it is estimated that the number of non-effective days lost through venereal diseases would approximate 21,000,000 days per annum, or a loss of approximately a half a day for each male of the United States between the ages of 15 and 45 years.—*Am. J. M. Sc.*, 158: 873-874 (Dec.), 1930.

Vital Statistics in England and Wales, 1929 and 1930—The economic depression in England and Wales seems to have had little effect upon the marriage rate of the country. During 1929 there were 15.8 marriages per 1,000 population; this was the highest rate since 1921. On the other hand the birth rate of 16.3 in both 1929 and 1930 was the lowest ever recorded since the establishment of the civil registration. The birth rate was the lowest of any European country except Sweden in 1929. In France the birth rate, which before the war was the lowest in Europe, has decreased more slowly than in most countries so that in 1929 it ranked above England and Wales, Norway, Sweden and Switzerland.

The death rate of 13.4 per 1,000 population in 1929 was the highest since 1919. The high rate was caused chiefly by an increase in the deaths from influenza and other respiratory diseases,

whooping cough and diseases of the heart. The first quarter of 1929 was marked by a period of severe weather, the coldest since 1895, and was accompanied by a serious outbreak of influenza. Preliminary reports for 1930 show a considerable decrease in mortality to a rate of 11.5, the lowest on record.

The adverse conditions of 1929 were also responsible for the increase in the infant mortality rate which rose from 65 per 1,000 live births in 1928—the lowest hitherto recorded—to 74 in 1929. According to preliminary reports for 1930, however, infant mortality reached a new low rate of 60 during the past year.—*Manchester Guardian Weekly*, 24: 129 (Feb. 13), 1931; *Lancet*, 1: 203 (Jan. 24), 1931; *Registrar-General's Statistical Review of England and Wales*, 1929.

Vital Statistics of the Irish Free State, 1929—The annual report of the Registrar-General of the Irish Free State for 1929 estimates that the population of the State in the middle of the year was 2,946,000. The figure given by the census of 1926 was 2,972,802. There is an increase in the number of deaths as compared with 1928, and a decrease in the numbers of births, of marriages, and of emigrants. The deaths represented a rate of 14.59 per 1,000 of the estimated population, the total number of deaths being 42,991. Of the causes of death, heart disease is placed highest with 5,616; tuberculosis next with 3,875; followed by cancer with 3,116; and influenza 1,659.

There has been an increase in the number of deaths by violence from 883 to 971; this is mainly due to two distinct causes—the increase of deaths from motor accidents, and an increased number of suicides. The total number of deaths from all forms of vehicular transport increased from 150 to 200, the number of suicides from 98 to 111. Up

till recently suicide was uncommon in Ireland, but it appears to be taking a place among the considerable causes of death.

The mortality from tuberculosis continued to show a gratifying decline. In 1919 the number of deaths from tuberculosis was 5,839, and in 1929 was 3,875, almost every intervening year showing a fall. The deaths from cancer are 74 fewer than in 1928.

The infant mortality was 70 per 1,000 births. The birth rate shows a decline when compared either with the rate in 1928 or with the average in the 10 years 1919–1928. In the period 1911–1915 the birth rate was 24.9 per 1,000 of the population; in 1924–1928 it was 20.57; in 1929 it was 19.78.

Illegitimate births constituted 3.2 per cent of the total. The mortality among illegitimate children was appallingly high; no less than 29.4 per cent died within the first year of life—a mortality more than four times the general infant mortality. The net emigration for the year—18,145—was the lowest on record, the average for the period 1911–1926 being 26,946. Nevertheless, it was more than enough to counterbalance the natural increase of population, or excess of births over deaths.—*Lancet*, 1: 156 (Jan. 17), 1931.

One Hundred Thousand Deaths—Ninety-seven thousand people were killed in the United States by accidents in 1929; this figure is likely to be increased to 100,000 before the year 1930 closes. Accidents this year will account for more deaths in the United States than does tuberculosis. Among males, accidents are second in importance to heart disease as a cause of death, and tuberculosis is seventh.

The 1929 accident fatalities exceeded those of 1928 by 2 per cent; but there was an increase of 28 per cent since 1920. The accident death toll of 97,000 last year is about 2,000 in excess of the

figure for 1928, an increase as large as any which has occurred in any single year since 1925. The 1929 accident fatalities had their origin in the home in 23,000 cases. The hazards of occupation accounted for another 23,000 deaths. In public places, there occurred some 51,000 deaths. The 51,000 fatalities in public places included 31,000 arising out of the use of motor vehicles. These 31,000 automobile deaths were the outcome of not less than one million injuries. These figures show an increase in motor vehicle deaths alone amounting to 3,000, or more than 10 per cent over the 1928 figure. Preliminary figures for 1930 show an increase of 4 per cent for the current year; or a total of some 33,000 deaths in automobile accidents before the end of the year.

Down to 1926, there had occurred each year a decrease in the number of fatalities per 100,000 cars registered. But beginning in 1927, this figure rose to 100.2 deaths for 100,000 automobiles; in 1928, the figure was 101.7, and in 1929, the fatality rate on the basis of 100,000 automobiles registered was 104.5. The highest death rates from automobile use occurred in the Pacific Coast States—34.5 per 100,000 in 1928; the lowest in the West South Central States (14.1 per 100,000). Contrasting urban and rural experience, we find in cities over 100,000 population the increase was from 21.1 to 23.8 per 100,000 or 13 per cent; in rural areas, the rate increased from 12.1 to 16.4 per 100,000 or 27 per cent between 1925 and 1928 or twice as fast as in the large cities. Deaths of children in automobile accidents decreased from 5,110 in 1927 to

4,943 in 1928. In 1928, 19.8 per cent of all automobile fatalities were of children under 15 years of age; in 1922, the figure was 29.4 per cent. According to the Interstate Commerce Commission, railroad grade crossing deaths involving automobiles were 2,102 in 1929, a decrease from 2,170 registered in 1928. Railroad crossing accidents where passenger automobiles were involved caused 1,741 deaths in 1929, a decrease from 1,820 in 1928.

Other public accidents not involving a motor vehicle accounted for some 20,000 deaths last year. Of these, some 8,500 were drownings, with July as the peak month. Persons under 25 years of age accounted for 56 per cent of the drownings. Firearms accounted for 3 per cent of all accidental deaths, or an annual toll of 3,000 in the United States. It was reported that for the 30,000,000 school children in the United States, some 700,000 accidental injuries occur annually, with 6,300 ending fatally. Accidental injury accounts in all probability for about 2,700,000 days of absence in our schools annually. Of the 23,000 fatalities in the home during 1929, in the United States, falls account for 40 per cent; burns, scalds and explosions for 24 per cent; asphyxiations for 14 per cent; and poisons for 9 per cent. The United States heads the list of all civilized countries of the world in its accident death rate—79.2 per 100,000. 'Canada was next in point of accident fatality rate, with a figure of 62.5 per 100,000; England and Wales had an accident death rate of 41 per 100,000, almost one-half the figure for the United States.—*Trans. National Safety Council*, 3: 3-7, 1930.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

CONTROL OF CROSS-CONNECTIONS IN TEXAS CITIES

W. N. DASHIELL AND EDGAR WHEDBEE

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PRIOR to about 1926 cross-connection of private water supply systems with the public water supply systems of practically all of the cities of Texas was permitted without much thought being devoted to the protection of the city supplies. There were no ordinances or water department regulations dealing with this question and in nearly all instances no records were kept of the location or any of the details of the connections. As underground water is comparatively plentiful in Texas, there has gradually developed a cross-connection problem in practically every city in the state.

There are no specific laws governing the installation of cross-connections in the *State Sanitary Code* which is used as a basis for the activities of the Sanitary Engineering Bureau of the Texas State Department of Health. A revision of the code presented during the 41st legislature, which met early in 1929, failed to pass, due possibly to the time required by more popular pending legislation than to any organized opposition.

A section of this proposed code provided that after December 31, 1930, no physical connection between the distribution system of a public water supply system and that of any other system shall be permitted unless such other water supply is of a safe sanitary quality, and the interconnection of both supplies is approved by the State Department of Health, and further provided

that where such physical connection existed and included two gate valves with indicator posts, two check valves of a design approved by the State Department of Health with drip cock and gauges for testing all located in a vault of water-tight construction, readily accessible for inspection, the date of discontinuance may be temporarily extended with the permission of the State Department of Health.

In the absence of effective legislation the work of cross-connection elimination has developed rather slowly. Perhaps the most effective work has been done in cooperation with the U. S. Public Health Service in its program of certification of water supplies used by common carriers operating in interstate traffic. Approximately 180 of the 500 or more largest water supplies in Texas both privately and municipally owned come under the federal certification procedure.

The Texas State Department of Health Division of Sanitary Engineering takes the position that all cross-connections are potentially dangerous and that every city should make a thorough cross-connection survey with a view to securing the prompt elimination of the more undesirable ones and to furnish data as a basis for developing a definite program for the gradual elimination or satisfactory correction of each. During 1928-1929 such surveys were instituted in Dallas, Fort Worth, Houston,

and San Antonio, and in several smaller cities.

The action taken by these cities has been followed by many others in starting programs of cross-connection control largely through educational and corrective procedure rather than enforcement through ordinance.

This paper deals only with that phase of cross-connection control relating to dual supplies for fire protection and auxiliary domestic and industrial supplies. The elimination of other cross-connections, such as with plumbing fixtures and swimming pool filters, has been largely attempted by educational means, through the efforts of the State Health Department and the Association of Master Plumbers.

During the spring and summer of 1929, the City Water Department of Dallas, coöperating with the State Department of Health, conducted a cross-connection survey of its water supply system. This survey was made as a part of the permanent program which Dallas now has under way to correct various sanitary defects in the public water supply system in order to secure unconditional certification on the basis of the Treasury Department Standards.

A list of 184 potential cross-connections which had been compiled by the Dallas City Health Department was found, to which additions had been made at intervals by the Water Department without complete confirmation by field investigation. These were the only available records at the beginning of the survey.

The procedure adopted was to visit all premises listed and where investigation revealed the presence of cross-connections detailed sketches and descriptions of the physical layout, showing points of interconnection, sizes of lines, valve control provided, static pressures and other pertinent information were prepared. In every instance where a secondary supply was found, consider-

able time was spent in definitely establishing the separation of the two supplies.

As a result of the survey, 44 cross-connections were located of which 8 were readily eliminated. Four of the connections were with supplies obtained from shallow dug or driven wells, and 3 with grossly polluted water.

The remainder of the group, 37 deep drilled wells used as auxiliary supplies for office buildings and industrial plants, compares well with the primary supply from the standpoint of potability and safety. With but one or two exceptions they are pumped by air lift apparatus. Three water bearing sands are used extensively in this area as follows: the Woodbine sands from 950-1,000 ft., the Paluxy sands from 1,600-1,800 ft. and the Trinity or basement sands from 2,200-2,400 ft. These lie in the Comanchean or Lower Cretaceous formation of the Mesozoic era and until very recent years produced artesian wells.

A number of the wells were subject to overflow from storm water or stoppage from sewage collection lines. Many of the ground reservoirs into which the wells discharge were open and subject to surrounding contamination.

There were no double check valve installations, and single cast iron checks were commonly used in the fire protection connections. Still other connections were found without check valves and in these the manipulation of one or two gate valves would establish an open connection with the primary supply. In nearly every instance there was no periodic bacteriological control of the water.

Effective July 1, 1929, the Dallas Water Department, through its Industrial Engineering Division, instituted a standby service charge affecting those industries which had city water connections and maintained a private secondary water supply. The charge is based on the average total monthly consump-

tion of each institution from its several water supplies, taken from the records of the preceding year. As Dallas does not have a sewer rental, the benefits of city water and sewer service were donated to those industries maintaining a secondary water supply system, prior to the time the standby charge was instituted. In March, 1930, Dallas passed an ordinance prohibiting any new cross-connections; providing for the disconnection of unsafe interconnected water supplies; and outlining sanitary improvements for the remainder of the cross-connections, including supervision by the Dallas Water Department; and further providing that after June 1, 1935, cross-connections heretofore provisionally permitted should be removed.

As a result of the above outlined activities of the Water Department, together with the establishment of a new attractive schedule of water rates for industrial consumers, there are at present only 5 cross-connections with the public water supply system, and it is expected that all will be eliminated within the next year or two. The Water Department also reports that its industrial water sales have been increased by the amount of 5 million gallons per day. At an average rate of \$.12 per 1,000 gallons, this increase represents additional revenue of approximately \$15,000 per month.

Heavy rainfall upon the watershed of Buffalo Bayou in the last days of May, 1929, resulted in the flooding of the central water supply pumping plant of the City of Houston and showed the necessity for emergency relief measures being instituted. A reorganization of the City Water Department was effected to include a sanitary engineering division, the duty of which should be to administer a definite improvement program for the water supply system. Houston obtains its water supply from deep drilled wells located at 8 pumping stations in the city.

Part of the program of the Sanitary Engineering Division was to conduct a thorough cross-connection survey of the water supply system. With these data as a basis a cross-connection control ordinance was prepared and adopted during March, 1930. Reports made to the State Health Department show that up to the time the ordinance was adopted approximately 57 cross-connections had been surveyed by the division. We have been unable to secure accurate information of the progress of elimination since the adoption of the ordinance last March.

San Antonio made a survey of cross-connections with the public water supply system in the early months of 1930. The survey was made by the San Antonio Water Board in an attempt to remove defects in the public water supply system listed as such in the water certification procedure. Thirty-two cross-connections were located as a result of the survey and a water board order was passed reaffirming the policy of not permitting any new cross-connections, and providing for the elimination of all existing connections. At present there are reported to be only 3 cross-connections and plans are under way for their elimination.

It is reported that the last cross-connections at Galveston were eliminated about two years ago and that no future cross-connections will be allowed in accordance with the city health code.

Fort Worth has had under way during the last year a program of cross-connection elimination similar to the one being carried out in Dallas. The water bearing strata from which Fort Worth derives its private well supplies are the same as those from which Dallas obtains the major part of its private supplies. The dip of these strata is such that their depth is approximately 1,000 feet less in Fort Worth than in Dallas. The procedure adopted in making the survey is similar to that em-

ployed in Dallas and the work is being conducted jointly by the City Health and Water Departments.

Approximately 15 cross-connections have been eliminated as a result of the survey and there still exist for correction about 30 connections with private water supplies.

Fort Worth also has a publicly owned separate raw water system, supplied with Trinity River water, maintained primarily for fire protection and street cleaning. Nineteen cross-connections between this public raw water system and the public water supply system have been surveyed. All of these were made for the purpose of securing a dual supply for building fire sprinkler systems. The pressure in the raw water mains is approximately 20 lb. per sq. in. higher than that normally maintained in the domestic system. Sixteen of the 19 connections have double cast iron check valves for the protection of the city supply and the remaining three have a single cast iron check valve. Many of these valve installations are so located as to be inaccessible to periodic inspection and several of the vaults are flooded with water. One installation had the check valves buried in concrete. The public raw water system was built in 1911 and there are no records to show that the check valves have been inspected since their installation.

An ordinance requiring physical separation of the raw water system and all private water supplies from the domestic system has been drafted and will undoubtedly come before the City Council

for passage within the next few weeks. The present policy of the water department is not to permit new cross-connections and to work toward the elimination of the existing ones pending the passage of a control ordinance.

In addition to the brief résumé of the above activities, considerable work has been done in many smaller Texas cities. At Texarkana 6 cross-connections between the privately owned city water system and private water supplies were eliminated this year in approximately 6 weeks following a survey by representatives of the Texas State Department of Health and the Texarkana City Health Department. Similar work has been done at Beaumont, Port Arthur, Orange and other places.

While the program as a whole has been extended over a considerable period of time, but more active during past 2 years, records in the State Department of Health show that approximately 500 cross-connections have been investigated in recent years of which number more than 300 have been eliminated. It is also felt that the statewide publicity on this work and the additional momentum gained from the definite position that the U. S. Public Health Service has taken with regard to cross-connections and the resulting recent action of our larger cities are doing much to reduce the cross-connection problem in Texas.—Paper read before the Public Health Engineering Section of the A. P. H. A. at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., PH. D., AND LEONARD GREENBURG,
M. D., PH. D.

Sixth International Congress of Industrial Accidents and Diseases—

This Congress which is to be held in Geneva, Switzerland, August 3-8, 1931, is the same as one which met in Budapest three years ago. Representatives have now been named for 17 countries, while several more are expected. For the United States the President of the Delegation is Dr. Francis D. Patterson, P. O. Box 4061, West Philadelphia Station, Philadelphia, Pa., and Correspondents: Professor Emery R. Hayhurst, Ohio State University, Columbus, O., and Dr. Francis D. Donoghue, Medical Adviser, Commonwealth of Massachusetts, Department of Industrial Accidents, State House, Boston, Mass. The balance of the American committee is rapidly being formulated and those interested should correspond with some one of the three above named.

The meeting will be a Joint Congress representing the activities of the Permanent International Committee on Accidents and the Permanent International Committee on Industrial Medicine. The activities have been divided into two sections: A. Surgery, and B, Medicine. The particular subjects so far devised are as follows:

Sections A and B

- I. Cutaneous Affections in Relation to Occupation (Accidents and Diseases)
- II. The Influence of Previous Health on the Results of Industrial Accidents and Diseases

Section A

- III. Sequelae and Final Results of Traumatic Wounds of the Spine
- IV. Traumatism of Blood Vessels (Arthritis and Thrombophlebitis)

Section B

- V. Illness Affecting Men Working upon Cement and Artificial Stones
- VI. Reaction of the Organism toward the Toxic Substances used in Industry
- VII. Fatigue

A certain number of additional subjects will also be dealt with. An exhibition of photographs, radiographs, and plaster casts relating to the subjects of the Congress will be on view at the university. Those who wish to exhibit should get in touch with Dr. Jentzer, 8 Rue de l'Université, Genève.

The three persons above named as heading up the American delegation have been supplied with printed material setting forth in full the details of the Congress and will be glad to dispatch to anyone interested a unit of the material so long as the supply lasts.

The Honorary Presidents named for the Congress are Dr. Kaufmann, Zurich; Professor Devoto, Milan; M. Albert Thomas, Geneva; Sir Thomas Oliver, Newcastle-on-Tyne; and Dr. Pometta, Lucerne. E. R. H.

High Lights of the Medical and Health Program of the Consolidation Coal Company, Inc., Year of 1930—

1. 163,024 individuals received medical attention. 42,768 of these were seen in the homes.

2. 30,837 individual typhoid inoculations were given. 11,002 persons were vaccinated for smallpox.

3. Typhoid fever and smallpox have been practically eliminated and other communicable diseases materially reduced.

4. 5,493 physical examinations were given to applicants for employment.

5. 5,027 occupational injuries were attended, requiring 11,408 subsequent attentions.

6. 835 babies were born; 449 being boys and 386 girls.

7. Total deaths numbered 204.

8. 350 clinics were held with a total attendance of 3,841.

9. 5,709 physical defects were corrected, most of these being dental, nutritional, nose and throat defects.

10. 50 classes in home hygiene were taught, requiring 346 sessions with a total attendance of 4,450.

11. Sanitary inspection committees made monthly inspections of most communities.

12. The "Jenkins" Hospital was accepted and accredited by the American College of Surgeons.

13. This hospital admitted 638 patients for major illness and injury.

14. 350 food handlers were given physical examinations.

15. Water and milk supplies were followed up by monthly inspections and laboratory examinations.

16. Regular monthly medical staff meetings were held in the larger divisions.

17. Hundreds of cases were provided with material relief through the efforts of the nurses.

18. Community organizations, such as Parent-Teacher Associations, Girl and Boy Scouts, have been fostered and developed by the nurses.

19. The staff and personnel consisted of 23 full-time, several part-time physicians and 12 public health nurses, coördinating with other agencies, health departments, private physicians and hospitals.

20. Facilities were increased, and program extended with a decrease in cost.—

D. J. Kindel, Medical Director, Fairmont, W. Va., Feb., 1931. E. R. H.

The Physiological Effects of High Concentrations of Carbon Dioxide—From the summary: The subjective and objective effects of toxic concentrations of CO₂ on men were studied, the percentages varying from 5.5 to 12.4 per cent with oxygen ranging from 14.4 to 39.7 per cent.

The concentrations of CO₂ were so excessive as to be tolerated for only a comparatively short time. The periods of exposure did not represent the extreme limit of endurance but a stage was reached beyond which serious symptoms

were impending. The maximum period of exposure was 22 minutes at 6 per cent and the minimum 1/2 minute at 10.4 per cent CO₂.

The respiratory rate per minute showed a tendency to a slight increase above normal; the pulse rate was accelerated in moderate degree; the systolic blood pressure always increased and rose with ascending CO₂ concentration—at 6 per cent CO₂ the increase was 18 m., at 10.4 per cent it was 52 m. and at 12.4 per cent 97 m. maximum; the diastolic blood pressure showed in general a trend similar to that of the systolic pressure; the average minute-expiration volume increased as follows: 203 per cent at 6 per cent CO₂, 225 per cent at 7.5 per cent, 228 per cent at 8.8 per cent, 279 per cent at 10.4 per cent, and only 153 per cent at 12.4 per cent CO₂. The last-named result is of particular interest, as it indicates a fall in the lung ventilation at this concentration of CO₂, whereas there was an increase up to and including 10.4 per cent CO₂. There were wide individual differences between subjects, as was observed in the other physiological responses.

The subjective symptoms were as follows: marked dyspnea resembling the effect of extreme physical exertion, dizziness, flushing and sweating of the face, feeling of stupefaction and an apprehension of impending collapse. The after-effects were practically limited to moderately severe headache but not persisting beyond 30 minutes. There was marked individual variation in the severity of the symptoms, certain subjects showing much less intolerance to high concentrations of CO₂ than others. It is not believed that any of the subjects could have withstood 10 per cent CO₂ for longer than 10 minutes without losing consciousness.

There was no evidence that high oxygen alleviated the toxic effects of the excessively high concentrations of CO₂ em-

ployed in these experiments.—E. W. Brown, Commander, Medical Corps, U. S. N., *U. S. Nav. M. Bull.*, 28, 4: 1930, 13 pp. ill. E. R. H.

Report, Division of Industrial Hygiene, Ohio Department of Health—This is a brief but comprehensive report of the Division's work which is divided into two parts, the first covering the period from July 1, 1915, to December 31, 1928, and the second for the calendar year 1929. These are the first printed reports summarizing the activities of the division's work for 15 years, due to the lack of funds for publishing same. As it is, the two respective reports are contained in a single volume which also encompasses the reports of all the divisions of the State Department of Health, both for the 14-year period and for the year 1929, within a total of 406 pages, including tables, graphs, and illustrations. Necessarily the material is therefore very compact and there is evidence throughout the volume of great thought being given to saying much in few words.

The 14-year report of the Division of Industrial Hygiene concerns the early history of the subject of industrial hygiene in the state, beginning in 1886, the names of the chiefs of the division since it was founded May 15, 1913, the major investigations made, the relation of the matter of compensable diseases to the Industrial Commission as well as the Department of Industrial Relations; the prime functions of the division; a table summarizing all of the occupational diseases reported to the division since it was established in 1913—a total of 10,761 case reports; and a summary of carbon monoxide poisonings occurring in the state and officially reported, these being chiefly of domestic origin.

The 1929 report of the division concerns its present personnel, its main activities during the year, and a table showing an analysis of the 1,411 case

reports of occupational diseases received during the year. Of these, 1,305 came under the *compensable* list under the state law while the *non-compensable* group was composed of 37 reports due to *specific agents* (chiefly poisons), 33 reports composed of various bodily *afflictions* (the agents not specified), and 36 reports which were regarded as *acute accidental*, i.e., due to single or limited exposures, and therefore not classifiable as occupational "diseases."

Another table analyzes the industrial sources of 183 cases of *lead poisoning* reported during the year, of which 5 were among females; another table presents an analysis of 985 case reports of industrial *dermatitis*, classified according to offending agents—the chief ones being oils and cutting compounds (197), rubber (179), benzine, gasoline, naphtha (47), plating solutions (54), "formica" (39), lime and cement (28), acids (35). Reference is made to an exhaustive study of *silicosis and tuberculosis* in the sandstone quarries of Lorain County which was started in 1926–1927 by Dr. Hayhurst and Dr. Kindel and was completed by the present personnel of the division and Dr. C. D. Barrett, health commissioner of Lorain County, and published in the *Journal of Industrial Hygiene*, September, 1929. Here, 919 workmen were stereoradiographed with a finding of pulmonary pathology in 55.1 per cent, including 28.5 per cent with silicosis in various stages. The total tuberculosis was, however, but 1.9 per cent. Likewise general disability was low. These findings checked relatively closely with those of the tuberculosis statistics for the community. The period for developing silicosis, namely, 16.24 years, was over twice that reported elsewhere. The rock was found to have an average content of from 92.15 to 97 per cent crystalline silica (SiO_2).

Likewise, an investigation of 32 cases of *occupational lung diseases* occurring

among sandblasters, emery grinders, stonecutters, and pottery men, is reported upon briefly.

Tables of domestic *carbon monoxide poisoning* mishaps, which are required to be officially reported in the state, are likewise presented as well as a list of the more intimate duties of the personnel of the division, of special trips made, notable persons visiting the division during the course of the year, chief publications made, radio talks, special lectures, etc.—Byron E. Neiswander and Emery R. Hayhurst, *Thirty-First Report (43d year), Ohio Department of Health*, 1931, pp. 188–195, 373–382. E. R. H.

Poisoning by Hydrocyanic Gas—

The annotation is based upon the article by Professor Joseph Barcroft in the *Journal of Hygiene*, January, 1931, page 1. It was found that the relationship between the concentration of hydrocyanic gas and the duration of exposure to it is not a simple one. The size of the animal was also found to be no criterion of its ability to survive, although when the total amount of HCN inhaled by each animal was calculated, it was found to be the same when the total ventilation rate of two animals like the cat and the rabbit was considered. Thus the concentration of HCN would be the same in the blood of both animals when death occurs. "The toxicity of the poison is due to its paralyzing effect upon intercellular oxydases, and the respiratory center is the earliest of the vital tissues to succumb. Canaries and pigeons are much more susceptible than rats and mice."

An actual experiment was made where "a man" and a dog were both enclosed in an airtight chamber, the atmosphere of which contained HCN at a concentration of about 1 part in 1,800. The dog became unconscious in 1½ minutes, while the man felt no symptoms. It is known also that mice and canaries

are more easily killed than the dog, and for this reason the mouse is sometimes used for testing the toxicity of an atmosphere. Here, however, a fallacy may arise since the observer who carries the animal into a suspected atmosphere is performing work, whereas the mouse may be at rest so that its relative sensitiveness is diminished. Where the concentration of the gas is low (0.1 mg. per litre) the best indicators are birds. A man could breathe this atmosphere for 10 minutes without harm, whereas canaries would be dead in 2 minutes. Precautions must be taken by the observer, however, not to exert himself unduly.

In regard to treatment artificial respiration and injection of glucose have been proposed. The latter was found, however, to have no protective action. Since the heart may go on beating for some time after respiration ceases, the greatest hope for recovery seems to lie in artificial respiration. This will also assist in dissipation of the HCN, and, if oxygen be used instead of air, it seems natural to assume that the dissipation of the toxin will be hastened.—*Lancet* (London), 5607: 362–363 (Feb. 14), 1931. E. R. H.

The Value of High Oxygen in Preventing the Physiological Effects of Noxious Concentrations of Carbon Dioxide—The following is taken from the summary of this illustrated reprint of 31 pages, including bibliography:

The two objects of the present investigation were to determine the following: (1) The influence of high oxygen on the noxious effects of high carbon dioxide in submarines and (2) the effect of high concentrations of carbon dioxide on physical and mental efficiency. The term high oxygen in these experiments signifies the maintenance of approximately normal oxygen under conditions of rebreathing in a closed space.

A total of 11 persons served as subjects of the tests, 4 being ordinarily designated for each experiment. The duration varied from $5\frac{1}{3}$ to 12 hours, the average approximating 8 hours. The subjects were not aware of the air conditions, thus eliminating the psychological factor in connection with the effect of oxygen.

Where the final carbon dioxide ranged from 4.7 to 5.2 per cent and the oxygen from 17.8 to 15.5 per cent (the oxygen being gradually reduced by rebreathing in proportion to the rise of carbon dioxide), no effects on breathing were noted at 2 per cent carbon dioxide except on exertion. The subjects in general were not definitely conscious of increased respiratory effort at rest until approximately 3.5 per cent was reached.

At the close of the tests of this group, slight depression, headache, chilliness, and fatigue were the chief symptoms, while body temperatures were subnormal, breathing was labored, but there was no feeling of actual dyspnea with carbon dioxide below 5 per cent.

A group of four tests was conducted in which the final carbon dioxide varied from 4.3 to 4.7 per cent and oxygen from 18.2 to 23.4 per cent. Here the subjective symptoms appeared to be somewhat less but the differences were not clear-cut. The depth and rate of breathing were not influenced.

It is not considered advisable to expose subjects to concentrations higher than 6 per cent of carbon dioxide where oxygen is not supplied.

Headaches persisted for 1 to 3 hours following the tests, but there was a wide individual variation in the type and severity of symptoms. Chilly sensations were general with a final body temperature of 1° to 3° F. subnormal. Persistent fatigue subsequent to the tests was an outstanding symptom.

An air combination of low oxygen and low carbon dioxide was also set up. Initial symptoms of oxygen depletion were noted between 13 and 14 per cent of oxygen, but no signs were manifested with oxygen between 14 and 15 per cent with low carbon dioxide, but the train of symptoms associated with 5.8 per cent of carbon dioxide and 14 to 15 per cent of oxygen were severe and were lessened to a considerable extent when oxygen was kept at the normal level.

Army Alpha cancellation and addition tests were carried out at successive intervals. The functions of attention, memory, association and deduction were involved. The results were striking in that the psychological effects were slight.

It is felt that the personnel could carry on their usual submarine duties for a protracted period, if carbon dioxide did not exceed 5 per cent, but it is believed that the majority would be completely incapacitated where carbon dioxide was above 6 per cent, which is regarded as the critical point. "The supply of oxygen would improve physical and mental efficiency between 5 and 6 per cent of carbon dioxide but would not prolong it beyond the latter figure."—E. W. Brown, Commander, Medical Corps, U. S. N., *U. S. Nav. M. Bull.*, 28, 3: 1930. E. R. H.

Workmen's Compensation Law and Industrial Board Rules—This 155-page pamphlet discusses in great detail the amendments, additions and annotations to the New York State Compensation Law up to November 1, 1930. It is impossible to present any detailed review of this pamphlet, except to point out that it is a mine of valuable information concerning the New York State Law and its interpretation.—New York State Dept. of Labor, Bureau of Statistics and Information. L. G.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

A New Factor in Nutrition—In feeding a concentrated product of B vitamins to rats on a vitamin-B free basal ration, it was noted that the hair of both the black rats and the black and white rats became silver gray, different in appearance from the result of anemia and without reduced hemoglobin. While rats appeared to be healthy, they were subject to xerophthalmia although there was no deficiency in vitamin A.

Reproduction was abnormal, some remaining sterile and others giving birth to litters which did not live. The material was given in greater amounts than is indicated for vitamin B sufficiency. With the addition of yeast to the diet, the discoloration of hair was observed in some cases but not in others. The material in question was supposed to be wheat germ from which the toxic elements had been removed. The introduction into the diet of wheat germ oil extracted either with acetone or ether did not prevent the hair from turning gray. Obviously removing impurities from germ oil also removed liposoluble vitamins. It is noted that this oil has been eliminated as a result of American experimenters who report toxic conditions. The authors comment that the doses were probably large enough to be harmful but in their series no adverse effects were noted with ordinary doses.

Subsequently, various alimentary meals were added which contained whole wheat as the base. In all cases, the rats without exception assumed the normal color of the hair. One group of rats was given whole wheat grains and the second the separated germ. In the

first case, the hair remained black, and silvered in the second, and in the latter case the hair assumed its normal hue with the addition of whole wheat to the diet. In all these cases with discoloration of the hair symptoms resembling xerophthalmia appeared which were not cured by cod liver oil.

It is believed that the toxic element in the wheat germ is counterbalanced by substances in the entire wheat. However, if the special product or wheat germ solely is administered for a sufficient length of time, the hair color returns to normal; the animals practically acquiring an immunity to the toxic substances. These experiments were performed on a large number of animals and are to be continued.—A. Bakke, V. Aschehoug, and Chr. Zbinden, *Compt. rend. Acad. d. sc.*, 191: 1157 (Dec. 8), 1930.

Digestion; Efficiency with Various Foods and under Various Conditions—This work represents an extension of the study by Hosoi, Alvares, and Mann (*Arch. int. Med.*, 41: 112, Jan., 1928), on Intestinal Absorption, particularly the effect of finely divided food and artificially retarded peristalsis. The work was performed on dogs after removal of the colon. The efficiency of the digestion was based on the moist weight of the food intake compared to the moist weight of the feces.

Both milk and sour milk were digested when given in large amounts. Residues in the former were 33 to 54 per cent, and in the latter 18 to 25 per cent, indicating better digestion with sour milk.

Cottage cheese was well digested but

impaired the digestion of food given the following day. The same effect was also observed with lard and lacto:c. Meat was better digested when fed in lumps than when comminuted and the same was true of potatoes. Raw meat was better assimilated than cooked meat. With fat, 10 gm. for each kg. of body weight appeared to be the limit. Raw egg albumin was practically undigested. Soft boiled and hard boiled eggs digested better, soft boiled eggs leaving the smallest residue. When raw egg was added to raw starch, the digestion of egg was improved, the residue of the mixed food being considerably less than the residue from either food alone.

Bread residues which were large were lessened when milk or coffee was given with the bread.

Cooked vegetables, such as potatoes, tomatoes, bananas, prunes, corn and peas, gave large residues, indicating poor digestion. Rice was almost perfectly digested. Relatively large residues were the result of feeding fruit juices, accounted for by the rapid passage through the bowel.

Forced feeding apparently had no effect on the amount of fecal residue. Excitement or anxiety in the case of one dog showed a residue of 77 per cent of the amount ingested, and when quiet, the figure dropped to 41 per cent in the case of the same dog. Heat and cold apparently had no effect.

The authors believe these studies will be a benefit in the treatment of humans requiring special diets; particularly noteworthy is the increased digestibility in combinations of foods neither of which is well digested alone, and the further effect of such substances as fats on the digestibility the day following ingestion. The experiment further revealed the fact that food taken in one large amount is better utilized than in several fractions at intervals. Frequent feedings stimulated peristalsis, causing the food to pass too rapidly. Purgatives

and sodium bicarbonate interfered with digestion, again of interest in human cases, making it difficult to tell whether the disturbance is due to purging or to a disease.—John H. Childrey, Walter C. Alvarez, and Frank C. Mann, *Arch. int. Med.*, 46: 361 (Sept.), 1930.

Chemicals Added to Flour—In many parts of France, complaints have been made because of the inferior quality of the bread. The complaints doubtless in part date from the war period, when the scarcity of wheat made necessary the addition to wheat flour of flour derived from other grains or from legumes. In some instances the bakers have continued this practice, as it increases the profits. Some even add powdered minerals to increase the weight of bread.

Successive decrees have restricted the authorized use of flours other than wheat flours to the periods when there is a deficiency of wheat flour, which does not obtain at present. A decree dated November 7, 1930, prohibits the addition of any mineral matter that is not authorized by the superior council of hygiene. This decree was aimed particularly against the salts used to bleach gray flour and to facilitate bread making.

The council of hygiene has recently authorized the use of such substances as are employed only to promote the action of the yeast; namely, potassium bromate, at the rate of 2 mg. per 100 gm. of flour, which constitutes 10 mg. of bromide per kg. of flour, a negligible quantity, and even less than the amount contained in ordinary table salt; and ammonium persulphate, at the rate of 3 mg. per 100 gm. of flour. Sodium perborate, much used in the past, has been prohibited.

It has been stated that the reasons for the acceptance of these substances are that they facilitate the action of the yeast and the rising of the dough, and,

in addition, make it easier for the baker to prepare the yeast when French wheat is used.

Messrs. Desgrez and Bonn of Paris and Mr. Laborde of Strasbourg performed experiments on guinea pigs for 2 months, using wheat that contained the permitted quantities of bromate and persulphate. The animals thus fed developed as well as the control animals and exhibited no changes in their organs.—Paris Correspondent, Dec. 17, 1930, *J. A. M. A.*, 96: 282 (Jan. 24), 1931.

A New Cereal Mixture Containing Vitamins and Mineral Elements—It has been stated that cereal grain furnishes 30 to 60 per cent of the calories of the average diet. Since they are consumed largely for their energy-producing value, they constitute a most important part of the daily diet. Whole grain cereals are deficient in many of the minerals and in all of the vitamins. In view of this fact, a cereal mixture composed of wheat meal, oat meal, corn meal, bone meal, wheat germ, dried brewer's yeast, and alfalfa, has been devised which, in addition to supplying energy, furnishes the necessary minerals and 5 of the 6 known vitamins.

Vitamin A is obtained from the wheat germ, and the alfalfa, vitamins B₁ and B₂ from the wheat germ, and the brewer's yeast, vitamin D from the irradiation of the wheat germ or yeast, and vitamin E from the wheat germ. The minerals are obtained from the bone meal, wheat germ and alfalfa, 3½ oz. of cereal containing as much calcium as 22 oz. of milk. The iron content is almost twice that of egg yolk, while copper is present in good concentration, 1.3 mg. per 100 gm. of cereal.

The mixture has been used almost exclusively in the Toronto Hospital for Sick Children, an institution containing over 300 beds. It is as palatable as the finely milled cereals now so widely used

and should prove a valuable addition to the diet, because of the many elements contained therein which are known to be essential for normal nutrition.—Frederick F. Tisdall, T. G. H. Drake, and Alan Brown, *Am. J. Dis. Child.*, 40: 791 (Oct.), 1930.

Commercially Prepared Infant Foods—In recent years there has appeared on the market a number of proprietary compounds for use in infant feeding. There are four groups of these commercially prepared foods and this paper describes the different groups.

The first group includes the so-called "reconstructed" baby food and is made up generally of powdered milk, cod liver oil and sugar, in addition to the milk sugar already present. These foods meet all the recognized food requirements of babies.

The second group is the so-called "milk modifier." While the milk sugar normally present in milk may be available for digestion by the baby, physicians feel that another sugar which can be assimilated quickly should be added in certain cases. For this reason, compounds have appeared on the market as "modifiers."

Another group is "protein milk." This has been designed for infants who have developed certain temporary complaints, particularly diarrhea.

The third group is "lactic acid milk." The use of this milk, which is made up of cows' milk to which has been added chemically pure lactic acid or the milk allowed by culture to develop its own lactic acid from the milk sugar, allows the baby to adjust itself to the diet of the cows' milk.

The fourth group is the powdered, evaporated and condensed milk. These brands are used by many mothers for older babies due to the conveniences of handling.

No attempt has been made in this

study to discuss the merits from a nutrition standpoint of the different brands of infant food on the market, and before adopting such infant foods, the mother should consult a physician as to the type of food essential and adapted to the particular infant.

The mother has a right to demand that these infant foods should meet the highest sanitary standards, which include the following:

1. The infant food should be produced under clean conditions and kept clean throughout its journey through the processing plant to the baby.

2. There should be no harmful bacteria present.

3. The number of bacteria present should be reduced to a minimum.

It is understood, from examination of a number of samples, that practically all of the infant foods now on the market meet these standards.—G. J. Hucker and Alice M. Hucker, *New York State Agri. Exper. Sta., Bull. 584* (Oct.), 1930.

Effect of Drying and Sulphuring on Vitamin C Content of Prunes and Apricots—There was previously reported the result of studies made on

vitamin C of peaches (abstract, this JOURNAL, 19: 1053, Sept., 1929, and 20: 1362, Dec., 1930). The present paper reports the effect of drying and sulphuring on the vitamin C of prunes and apricots. The fruit was prepared as in the previous experiments. A table is given showing the composition of the fruits tested.

Guinea pigs were used as test animals and they were fed doses of the different fruit products for 60 to 90 days. At the end of the 90 days, autopsy was performed on all animals and examination made for symptoms of scurvy. The 60-day period was found to be as effective for assay of vitamin C as the 90-day period. Both the dehydrated prunes and apricots retained vitamin C more completely than did the sundried. The dehydrated and sundried apricots containing 450 to 500 or more p.p.m. of sulphur dioxide retained the antiscorbutic property more or less completely. With a less amount, this property was lost entirely. All of the unsulphured fruits whether dried or dehydrated had no antiscorbutic value.—Agnes Fay Morgan, Anna Field, and P. F. Nichols, *J. Agri. Res.*, 42: 35 (Jan. 1), 1931.

CHILD HYGIENE

RICHARD A. BOLT, M. D., DR. P. H.

IT was indicated in last month's JOURNAL that education for parenthood should really begin in our secondary schools where it can be correlated readily with home economics and science, as well as with other subjects. In the tentative report¹ prepared by the late Anna E. Richardson, Chairman of the Sub-Committee on Education for Home and Family Life, of the White House Conference on Child Health and

Protection, the importance of well planned courses in these subjects is stressed. A number of progressive high schools throughout the country have already incorporated such courses in their regular curriculums. Where these can be combined with actual observation of young children, and opportunity given to assist in their care, there is every reason to believe that considerable good will result.

But such instruction in the schools is not enough. It must be continued with greater emphasis into the parental period. Courses along the line of parental education are now offered in many university extension centers, and numerous organizations, among them Parent-Teacher Associations, Federations of Women's Clubs, etc., are taking an active interest in this work. Popular magazines and newspapers are publishing articles featuring maternal and infant care.

Literature published by the U. S. Children's Bureau has reached to every corner of this country. Its pamphlet on Prenatal Care,² published in 1913, written originally by Mrs. Max West, and recently completely revised by an advisory committee on obstetrics, has undoubtedly had the widest circulation of any material of this type, distribution reaching into millions of homes.

The revised edition has been brought up to date and is more attractively illustrated. It is simply written, authoritative, and appeals to the interests of mothers and prospective mothers. Health officers would do well to give this prenatal educational brochure wide distribution.

The Maternity Center Association of New York, after a thoroughgoing demonstration of what can be accomplished in maternal hygiene, now proposes a new use for Mother's Day, with the practical purpose of pointing out the dangers to which motherhood is exposed, and bringing to the attention of the laity and medical profession alike the possibilities of reducing the altogether too high maternal and early infant mortality in this country.

A nation-wide campaign of educational publicity is to be conducted with emphasis upon a study of the local maternity needs, and possibilities for bettering conditions. In setting forth this program, Dwight S. Anderson³ has the following to say:

Mother's Day—May 10—will signalize a national educational movement to direct the attention of the American people to our deplorable maternal death rate, said to be the highest in the civilized world. It is hoped to make Mother's Day this year mark the beginning of an attempt to get adequate maternity care for every expectant mother.

Mother's Day seems the opportune time to direct attention to this subject. As the appeal is planned to be entirely educational, without any features of money raising whatever, it is felt that people will welcome a constructive use of this occasion—a new Mother's Day wholly without commercialized propaganda. Endorsements were given by Surgeon General Cumming of the U. S. Public Health Service and Grace Abbott of the Children's Bureau. The coöperation of women's clubs was obtained through the endorsement of Sadie Orr Dunbar, Chairman of the Welfare Division of the General Federation of Women's Clubs.

While national publicity⁴ is planned, including radio talks, news stories, as well as display advertisements and articles in magazines, trade journals and house organs, dependence for results rests principally with local clubs and health groups which are to engage in the campaign. Such organizations are to be assisted in promoting a local campaign in their own names, using ideas and suggestions which will be sent interested persons.

In order effectively to draw public attention to the need and importance of adequate maternity care, those interested in community efforts are urged, during the week or two before Mother's Day, to familiarize themselves and their professional associates with the local maternity situation; that is, the number of births, the number of doctors, the number of midwives, the number of hospital beds for maternity patients, the available nursing and home help services, the number of mothers who die having babies, the number of babies who do not live a year, the number who are born dead. How early in pregnancy do mothers come under medical care and does that care continue until the baby is 6 weeks old?

It is suggested that Mother's Day publicity efforts include:

1. Newspaper stories, concerning local and national maternity work. Interviews with a prominent obstetrician or laywoman; homely interesting items by the president of the Hospital Board or the local director of any Health or Nurses' Association.

2. Editorials. Editors of papers, whether city or country, daily or weekly, should be requested to comment editorially on the above material.

3. Proclamation from the local Health Officer should be obtained, endorsing such observance of Mother's Day as will result in improved maternity care.

4. Announcements by pastors of Mother's Day and its observance in a modern enlightened way, calling attention to whatever meeting has been planned.

5. Educational literature for mothers and fathers.

Articles, stories, advertisements, suggestions for editorial comment, and educational literature for mothers and fathers can be obtained from the Maternity Center Association, 578 Madison Avenue, New York, N. Y., free of charge.

This endeavor is to be highly commended, but it is hoped that it is just the beginning of a concerted effort to extend the routines and technics already so well worked out by the Maternity Center Association. Furthermore, it seems that here is an opportunity to give widespread publicity to the findings of the Sub-Committee on Prenatal and Maternal Care, of the White House Conference.

It would be enlightening to secure the opinions of the state bureaus of child hygiene which have sent out prenatal letters to prospective mothers in their states. These letters, in one form or another, have been widely used a decade or more, and some of the states continue to use them. Where they have been prepared with the coöperation of the local or state medical societies and used by the doctors in their private practice one would expect a noticeable amount of good to have resulted. Where these letters can be followed up by the instructions of public health nurses, and by repeated examinations by physicians, either in their own offices or in prenatal centers, the maximum good can be accomplished. Visiting nurses in some of our larger cities have already shown what can be done along these lines. Another avenue of approach which has been tried but little is the sending of one of the booklets on prenatal care to all newly married couples, the names

being obtained from the marriage register clerk. This would call attention to the importance of getting in touch with a capable physician as early in pregnancy as possible. Physicians should also have a supply of simply worded pamphlets which can be given to their regular patients.

A method of prenatal instruction which has proved valuable is group instruction in the prenatal centers or in clinics where patients are waiting for the physician. This has been done in Cleveland for the past 4 years in connection with the Maternity Hospital and its 7 prenatal centers, and in 3 of the other hospitals. An experienced and well trained public health nurse is employed to conduct the classes in the various centers. She early prepares a set of lesson sheets on the most important points in prenatal care, which the physicians connected with the hospitals approve before they are put into use. Her method is a simple direct approach to practical every-day problems and answering any questions which arise. This work is supplemented by group instruction, conducted by a trained nutritionist who carries out actual demonstrations in preparing suitable foods. It not only occupies the time which might otherwise be taken up by gossip among the patients, but gives them useful suggestions and educates them to appreciate the value of good prenatal care. During the past year over 3,000 mothers and prospective mothers were reached by this group instruction, and of this number only 1 maternal death occurred. This type of instruction, coupled with visual education in the waiting room, should do much to make the physician's work easier and result in better follow-up on part of physician and nurse.

Every hospital which accepts maternity cases should make ample provision for thorough prenatal service. This is relatively easy for the exclusively maternity hospitals, with a closed staff,

especially when under university auspices. But it is much more difficult where the maternity work is simply part of a general hospital service, and open staff arrangements prevail. Here it is difficult to standardize the routines and to get the individual physician's patients under proper prenatal care early enough in pregnancy. We should strive to bring about the organization of a prenatal service in such hospitals, however, as an extension of the regular nursing and social service departments.

It is enlightening to study intimately the results of obstetric service in a number of the hospitals of a large city. One is immediately struck with the great difference in maternal and early infant mortality rates in the different hospitals. While the causes back of this may be complex, in many instances it is readily discernible that the hospitals making ample provision for careful prenatal care and instruction, and having a proper control over obstetric routines, exhibit the lowest mortality. If the local health authorities should compile each year a list of local hospitals showing the number of obstetric beds in each, the total live births, stillbirths, and deaths under 2 weeks, together with the maternal deaths, it would afford a basis for comparison which would be very salutary and indicate places where improvements could be made.

Advantage should be taken of every occasion to bring before the whole community the problems of maternity and infancy. For the past few years Child Health Day—May Day—has afforded such an opportunity. This has been taken advantage of in a number of states. Among those which have carried on consistent and widespread health education Indiana ranks high. Last year Indiana had a well planned program for Child Health Day, with radio talks and a general meeting attended by

representatives of all the health interests of Indianapolis. This year plans are already under way for the May Day celebration. A very attractive mimeographed program⁶ has been prepared which contains definite suggestions as to how this day can be used throughout the state for educational purposes.

The *Eighteenth Annual Report of the Chief of the Children's Bureau* is replete with information relating to the work of the bureau for the year ending June 30, 1930. It discusses the final work in connection with the administration of the Maternity and Infancy Act of 1921 and reviews pending legislation for maternity and infancy. The Senate Bill Number S. 255, which it mentions, was amended by the House Committee on Interstate and Foreign Commerce⁶ to provide for a county health unit organization to promote general health measures as well as for a special maternal and child health program. The amended bill was reported favorably out of Committee and passed the House of Representatives a few days before adjournment. It was placed on the Senate Calendar for action but failed to pass on account of a filibuster which developed in the closing hours of Congress. The proponents of the bill undoubtedly will revive it in the new Congress which meets next December.

REFERENCES

1. Richardson, Anna E. Elementary and Secondary School Education for Home and Family Life, *J. Home Econ.*, 23, 3: 229-233 (Mar.), 1931.
2. *Prenatal Care*, Publication No. 4, U. S. Children's Bureau, 1930.
3. Special statement prepared for the A. J. P. H.
4. See educational material prepared by the Maternity Center Association, 576 Madison Avenue, New York, N. Y.
5. *May Day—Child Health Day—Helps Meet the Challenge of the Children's Charter*, Indiana State Board of Health, Child Hygiene Division; prepared by Dr. Ada E. Schweitzer.
6. Hearing before the Committee on Interstate and Foreign Commerce, House of Representatives, 71st Congress, Third Session on S. 255 and H.R. 12,995; Jan. 20, 21, and 22, 1931; U. S. Government Printing Office, 1931.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

Public Health Nursing in Alberta and Saskatchewan—Public health nurses are employed in three rural municipalities in Alberta. Half their salaries are paid by the municipalities, half by the Province. One nurse demonstrates home nursing and first aid at the request of local organizations and is in great demand. Child welfare stations in Calgary, Edmonton and Medicine Hat are in charge of public health nurses.

Seven district nurses are stationed in frontier communities, mostly in the northern part of the Province where there are no medical or hospital facilities of any kind available. These nurses are very carefully selected and are required to have special obstetrical training. They provide special service in midwifery, bedside nursing, child hygiene, first aid and the like.

In the summer several public health nurses travel through the Province with a Travelling Child Welfare Clinic. Local physicians are invited to coöperate in the conferences arranged by local organizations. These conferences are attended mostly by preschool children who are weighed, measured and inspected, and mothers are advised with reference to diet and correction of defects.

In Saskatchewan the Victorian Order of Nurses has placed one of its nurses in each of three rural districts as an experiment. They do bedside nursing similar to that done in urban centers. The Victorian Order pays their salaries

and supervises their work; each municipality gives a grant to the V. O. N. and patients pay a nominal fee when they can. Each nurse is supplied with a car by the Department of Health. The hope is that when a demonstration has been made the municipalities will carry on the work entirely at their own expense.

There are 14 government nurses located in various parts of the Province. One of these nurses serves all maternity cases in one municipality at the expense of the local municipal government, and in a period of 6 years there were 185 births and no maternal deaths. In the same period the infant mortality was 48.7, and not one death from a communicable disease occurred.

REFERENCES

- Bow, M. R. Public Health Services in Canada, *Canad. Pub. Health J.*, XXI, 12: 594 (Dec.), 1930.
Middleton, F. C. Health and Sickness Insurance in Saskatchewan, *Canad. Pub. Health J.*, XXI, 12: 603-604 (Dec.), 1930.

Another New Course in Public Health Nursing—A Department of Public Health Nursing was opened at Syracuse University in February, 1931. Ellen L. Buell, R.N., formerly Educational Director of the Henry Street Visiting Nurse Service, New York, N. Y., is director.

The length of the course is approximately one college year and one summer session totalling 36 credit hours. A certificate of Public Health Nursing is to be granted by the College of Medicine of the University. If nurses are interested they may write to Miss Buell for the bulletin describing the courses of study.—Abstracts from Preliminary Announcement of Course.

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

Measles Conference—Public health nurses joined health officers, representatives from the State Charities Aid Association, the State Medical Society and other organizations in a general conference on measles in Albany in January, arranged by the New York State Department of Health.

The conference conceded that measles cannot be prevented but that much can be done to decrease the number of complications which often prove fatal. The following important facts were emphasized:

1. The disease should be postponed until after the 3d and better until after the 5th birthday.

2. Adequate medical, nursing, and hygienic care are the most important means of preventing complications and a fatal outcome.

3. The disease is particularly fatal among undernourished and underprivileged children, and unusual methods of control must be applied to prevent or ameliorate the disease in such children.

The conference agreed that public health nurses could best be used in preventing measles:

1. By discovering other unreported cases of children who have been exposed and whose families have not been instructed.

2. By instructing families how to make the best use of available facilities. This should extend to actually demonstrating how to prevent complications through the isolation of the case, choosing the right room, securing proper ventilation and adequate light, cleanliness and orderliness of surroundings, and care of the patient.—

Health News, New York State Dept. of Health, VIII, 5: 19, 20 (Feb. 2), 1931.

More about the Health Officer and the Public Health Nurse—There may be several groups of public health nurses working in a community, one employed by the board of health, another by the visiting nurse association, and the other by the school health department, but if each nurse looks upon herself as a part of a larger group working for the whole community there will be no trouble in

defining what the relationship should be of the different groups to each other and to the health department.

If there are two or more groups of nurses of this kind, however, it is important that they meet together frequently to talk over their problems and become familiar with each other's work. In these meetings also definite plans for special health education programs can be worked out. All the nurses as they visit homes can be on the alert for suspicious cases of tuberculosis, communicable diseases, cancer, etc. Even helpful advice about sunshine and cod liver oil in the prevention of rickets can be given mothers instead of leaving it all for the infant welfare nurses.

Dr. Denny says:

The first thing to do is to decide on what special phases of health work to concentrate. There probably should not be more than three or four different lines of health propaganda to be carried on at any one time and these might be changed from time to time. These could best be decided on by the whole nursing group in conference with the health officer and others familiar with conditions in that community and would vary in different places.

At the present time it would be wise almost everywhere to work at diphtheria immunization. If this were to be done, I would suggest some such procedure as this: Each and every nurse on her visits should inquire whether all the children have been protected. If they have been, a word of commendation is in order. If they have not been, and there is a marked attitude of hostility, it is probably best at first not to say much more than enough to show that the nurse and the organization she represents think favorably of it. Above all, the nurse should not start an argument and force the parent to take a position she will continue to try to defend. At the next visit tell how many children have been treated at the school her children attend or at the nearby health center. Most people hate to be with the minority. They follow like sheep what most of the flock are doing. At a subsequent visit, if still resistant, it is well to speak of some definite case of diphtheria, preferably in the neighborhood, and some family that the mother knows about, where the parents had been meaning to protect the child but had neglected to do so and

now are full of regrets. It is very uncomfortable for us parents to think how we are going to feel if our child gets a serious disease which we might have prevented.

A carefully planned procedure like this just outlined gradually overcomes what is called in the commercial world "the sales resistance" and you finally sell your proposition. The important thing is not to fire all your guns at once but by subtle repetition and by different methods of approach gradually to get the lesson across. With all the nurses in the community, working at the same time for the same object, I am convinced that an astonishing amount could be accomplished.—

Francis P. Denny, M.D., The Relationship of the Nurse to the Health Officer Group, *The Commonwealth*, Massachusetts Dept. of Health, 17, 4: 175-177 (Oct.-Nov.-Dec.), 1930.

Walter Burns Saunders Memorial Medal—The second award of the Walter Burns Saunders Memorial Medal for an outstanding service to nursing will be made this year. At the biennial convention of 1930 the first medal was awarded posthumously to S. Lillian Clayton, former President of the American Nurses Association.

Distinguished for Service in the Cause of Nursing—These words below the name of the recipient mark this medal which is given by W. L. Saunders II, of Philadelphia, in memory of his father, William Burns Saunders.

The recipient to whom the reward will be made must be a member of the American Nurses Association, who has made to the profession or to the public some outstanding contribution either in personal service or in the discovery of some nursing technic that may be to the advantage of the patient and to the profession. The only kind of service excluded is that of writing.

Recommendations should be submitted to the Headquarters of the

American Nurses Association, 370 Seventh Avenue, New York, N. Y., before April 6, 1931.—Walter Burns Saunders Memorial Medal, American Nurses Association Release, Jan., 1931.

The French and German of It—
As nursing activities have developed in the different countries of the world, much confusion has ensued because each country had a different term for the same worker or type of work. Consequently the Nursing Division of the League of Red Cross Societies in collaboration with the International Council of Nurses, after studying the idioms most commonly used, and classifying them, have thus recommended the French and German translations for many hospitals, nursing and social work terms. We are giving four of these terms which might be of particular interest to public health nurses:

<i>French</i>	<i>German</i>
<i>Social Worker</i>	

Assistante sociale; travailleuse sociale; auxiliaire sociale	Fürsorgerin, Sozialarbeiterin
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<i>Trained (General) Nurse (Graduate Nurse)</i>	
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Infirmière diplômée	Staatlich anerkannte Krankenpflegerin; ausgebildete Krankenpflegerin; geprüfte Krankenpflegerin; ausgebildete Schwester
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<i>District Nurse</i>	
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Infirmière visiteuse	Gemeindeschwester
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<i>Public Health Nurse</i>	
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Infirmière visiteuse; infirmière d'hygiène sociale	Wohlfahrtspflegerin; Fürsorgeschwester
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Nursing Phraseology, *Information Bull.*, League of Red Cross Societies, IX, 11-12: 344 (Nov.-Dec.), 1930.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Suggestions Invited—"What Everyone Should Know About Cancer," the well done booklet of the American Society for the Control of Cancer, 25 W. 43d St., New York, N. Y., is about to be reissued. There are few high-brow words in it. Can you find one which should be changed? Do you question any statement? Any suggestions to offer Dr. R. V. Brokaw, executive secretary? A copy of the booklet will be sent free upon request.

How About It?—In neighborhoods where there is considerable unemployment could health agencies experiment with "health entertainment" programs? Movies, slides, very brief talks, questions and answers, plays, music? A vacant store? Use volunteers.

Make a fresh attack upon diet at this time?

Tackle "worry"? Boost recreation possibilities?

Try to help present conditions—and *get some of your own job done?*

1931 Publicity Awards—As announced by Social Work Publicity Council, 130 E. 22d St., New York, N. Y., the following will be considered: annual reports, envelope stuffers, house organs for the public, staff house organs, industrial posters, published educational photographs, social case work stories, suburban publicity. Closes April 15, 1931. Many of past awards have gone to health organizations. Any member of S. W. P. Council will have full details.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

A New National Medium—"Keeping Up With the World!" is a new department in *Collier's Weekly*, 250 Park Ave., New York, N. Y.—a weekly column made of paragraphs—fact, figures, fancy. Plenty of items possible from the health field, and \$1 is paid for each one accepted.

When It Is New—Then is when the editor wishes to see specimens of all types of your publicity. Will you send samples upon request? Free? For how much postage? Sale price? See editor's address at bottom of this page.

The Research Spirit in Health Education—The following is quoted by *Hygeia* from the committee on research in education of the American Association for the Advancement of Science:

We believe that every normal individual is born with some endowment of the research spirit . . . that this mental habit of learning by self-reliant experiment should be conserved and strengthened from the beginning throughout life.

Is not the questioning, testing, observing attitude—the learning attitude—of immense importance to those who seek to change health habits? Some of the health bulletins do not seem to have changed in all the 10 to 20 years they have been reaching me. Even the paper or type remains the same—and in some cases it is atrocious.

The A. A. A. S. report continues:

We believe that all education from pre-kindergarten age on through the university should have this encouragement of the spirit and habit of research as a main object. . . .

We believe that teaching should be conducted only by those who have the research attitude themselves and have ability to cultivate it in their pupils.

This seems to be addressed not only to the teachers in schools but also to the teachers who use the newspaper, the lantern slide and other mediums. You will want to read "The Scientific Mind" in *Hygeia*, Feb., 1931.

Not What It Once Was—Did you read *Hygeia* once upon a time and did you give it up because it lacked many of the elements of a successful popular health magazine? Then you should look over some 1931 issues. The range of the illustrations has a wide appeal beyond the health content of the articles. Titles and text grow better and better. The armor-plate paper was abandoned long ago. The advertisements look interesting and many of them are good reading. But see for yourself. The American Medical Association is to be congratulated for its faith and persistence in the face of many difficulties.

SCHOOLS AND CHILDREN

This department looks forward to the time when there will be adequate provision in the *Journal* for the interests of schools and teachers in the health field. Likewise in the annual meeting. Neither the Public Health Education Section nor the "Education and Publicity" department of the *Journal* should be depended upon for a halting recognition of this vital place of the health movement. Will not some one get this idea before the powers that control our destinies?

If you are concerned with health in the school you read *Hygeia* as a matter of course. So far as we know no other periodical department carries so much of value to the teacher and the health worker. Along with this should go *Child Health Bulletin* (American Child

Health Assn.), which serves a partly different service. It is not possible in this department to call attention to the particular issues of these periodicals—and it should not be necessary.

Frequent articles on classroom teaching or reports of experiments: *Public Health*, Michigan Dept. of Health, Lansing; *Public Health Nurse*, 450 7th Ave., New York, N. Y.; *Red Cross Courier*, Washington, D. C. *Samples free.*

Material for classroom teaching in: *The Crusader*, Wisconsin Anti-Tuberculosis Assn., Milwaukee; *School Health*, Tuberculosis and Health Society, Detroit; *Child Health*, Oregon Tuberculosis Assn., Portland; *Safety Education*, National Safety Council, 1 Park Ave., New York, N. Y. *Samples free.*

The Feb., 1931, issue of *Journal of the National Education Assn.*, Washington, D. C., contained the 36th article of the series on mental hygiene.

Says a mailing card addressed to physicians:

A health certificate is required of every child entering school. Seven out of 10 need medical care. Take your child to your physician *now* for examination and treatment.

The above is a reproduction of a card put out by Brooklyn Tuberculosis and Health Assn., 293 Schermerhorn St. On the address side one-half of space is given to a letter from the president of Medical Society of County of Kings. The card is 6" x 9".

"Making a School Movie." *Cleanliness Journal*, Cleanliness Institute, 45 E. 17th St., New York, N. Y. *Free.* Making a "movie" (in any school or club) without photography or projection machine. A device good for exhibits—as made by children or adults. "Teaching School Children Health: How Best to Reach Boys and Girls in Different Age Groups," by Dr. Iago Galdston. *Everybody's Health*, St.

Paul, Minn. Feb., 1931. 10 cents. A brief statement of first considerations.

The *Missouri Public Health News* (State Board of Health, Sept., 1930) reports on the Blue Ribbon Baby Health Contest conducted at the State Fair. There were classes for rural and town boys and girls—12 to 24 months, 24 to 36 months, 36 to 48 months.

An educational program addressed to junior and senior high schools is being launched by the American Eugenics Society. Address them at New Haven, Conn.

Health in High Schools—a symposium. National Tuberculosis Assn., 450 7th Ave., New York, N. Y. For everyone concerned with high school health. 40 pp. 5 cents.

Teacher's Inventory of Health Assets. National Tuberculosis Assn. Questions on "The Schoolroom," "The Community" and "The Pupils," with "Progress Chart." "Given as examples of what the teacher should ask in order to know whether her health teaching is carrying over into practice in the schoolroom, the home and the community." Likewise a tool for parent-teacher associations, home bureau workers and others who wish to check back from the community to the school. 75 cents for 100.

"Health—the first objective in Education." Welfare Division, Metropolitan Life Ins. Co., New York, N. Y. Classified list of publications issued by School Health Bureau.

You Have An Square A Lunch—Why? National Dairy Council, 221 N. LaSalle St., Chicago, Ill. 16 pages. A study of classroom-lunchroom health teaching directed by Dr. Lydia J. Roberts, University of Chicago. *Free*. Supplemented by teaching material. 50 cents a set.

Health Bulletin for Teachers. Issues for April, 1929–June, 1930, combined. Metropolitan Life Ins. Co., New York, N. Y. Addresses of publishers and

prices are not given with reading references.

The Health and Cleanliness Chronicle of a Junior High Training School. 30 pages. Dull finished paper. *Free for Junior High Schools*.

"No satisfactory text available" on health education says "A Curriculum for the Professional Preparation of Physical Education for Secondary Schools." In the list of reading references *no prices are given* and the *number of pages is not shown*. A regrettable omission. From California State Dept. of Education.

Health and Physical Education Series—Grades I to III. Ohio Dept. of Education. Foot note and reading lists are uneven, *but the majority give the city as well as the publisher*. Prices for 2 groups of pamphlets. The following is significant:

Commercial advertising material may be secured for health teaching. Care should be exercised that it be attractive and true to fact. Circulars and pamphlets containing a minimum amount of good health material and a maximum amount of advertising should be avoided. Schools cannot afford to be used for commercial advertising purposes.

Cleveland schools are not allowed to use health advertising material without special permission from the board of education. In Dayton such material may be used for classroom purposes although it may not be distributed to the children to take home.

HONORABLE MENTION

To the Commonwealth Fund: for Annual Report for 1930—for the aquatone illustrations, type, paper, and table of contents (the last is difficult to find because it does not follow the title page).

To St. John's Guild (floating and seaside hospitals): for Annual Report with table of contents—with committees and officers listed on 3d and 4th cover pages *as indicated in table of contents*—with pages of half-tones scattered through the many pages listing donors and contributors. New York, N. Y.

RADIO

"The Level of Thirteen-Year-Olds," by William Orton. *Atlantic*. Jan., 1931. "What broadcasting is and might be."

The *New York World* gives the credit to radio:

It has shortened the speeches that the citizenry has to endure. Time was when the chief orator at a public gathering took from forty minutes to an hour and a half to reveal that he had nothing to say; the fact probably had a lot to do with the mounting death rate from nervous diseases. But the radio has changed this. . . . There has been a great deal of condensation, and particularly a mortality among the comical Scots, Jews and Irishmen brought to mind by the opening remarks of the toastmaster. . . . Also, there has been a diminution in the water-drinking, coat-buttoning and for-reply-pausing that used to be such a trial on the patience.

V. W. Marr, chairman of Radio Committee, Publicity Group of Boston Council of Social Agencies, offers the following advice to broadcasters:

To arrive late at the studio is one of the most serious offenses in the radio world. Until the arrival of assigned performers, the program manager is sitting on needles and pins wondering whether the scheduled talent is to arrive. Consequently, all broadcasters are requested to be at the studio at least one-half hour before the time scheduled for their broadcast. They should report immediately to the person in charge of the studio.

Another matter of equal import is overtime. Any person who runs over his allotted time in a broadcasting studio is an unwelcome visitor and his chances of further performances are slight. He not only cooks his own goose, but, in the case of a series, jeopardizes the chance of others to obtain the facilities of the station gratuitously.

It appears that too many of the agencies are submitting stereotyped articles with the assumption that the radio audience is, or will become, interested in their cause. Consequently, agencies are urged to bear in mind the slogan "Entertain and Interest."

The Heart Council of the Cincinnati Public Health Federation reports 500 requests from 33 states for pamphlet copies of radio talks.

Connecticut State Dept. of Health reports a radio listener who was led to substitute a visit to a physician for a dose of salts. The listener was hurried to a hospital for an acute appendicitis operation.

Philadelphia Dept. of Health broadcasts over WFI every Tuesday at 6:45 p.m.

"Devils, Drugs and Doctors," a 15-minute broadcast by Dr. H. W. Haggard, sponsored by Eastman Kodak Co., over Columbia System, Sundays: 8:00 p.m. (E. S. T.), 7:00 p.m. (S. C. T.), 6:00 p.m. (M. S. T.), 5:00 p.m. (P. S. T.). Printed copies free.

The Canadian Social Hygiene Council, Toronto, Can., supplies a series of 30 radio talks on various health topics to 16 stations for local broadcasting. Copies may be secured from the Council.

Copies of radio talks may be secured from State Dept. of Health, Hartford, Conn.; State Board of Health, Raleigh, N. C.; Ohio Public Health Assn., Columbus, O.; Bureau of Health, Rochester, N. Y.; U. S. Public Health Service, Washington, D. C.; Cleanliness Institute, 45 East 17th St., New York, N. Y.

On Feb. 4 was given the 82d of the radio talks on "Your Health" broadcast Wednesday afternoons over WEAf by Dr. Shirley W. Wynne, 505 Pearl St., New York, N. Y., who will supply copies on request.

Whenever the 100th broadcast is reached by the New York State Dept. of Health the series is printed in a neat paper bound volume numbering about 125 pages. The fourth volume of *Health By Radio* has appeared. Many of these talks can be taken over by other states and cities with slight changes.

EDUCATIONAL MATERIAL

Prenatal Care. Children's Bureau, Washington, D. C. Revised "best seller."

Carbon monoxide booklet—both French and English. Provincial Bureau of Health, Montreal, Can.

Management of Cases of Communicable Diseases in Isolation or Quarantine. State Department of Health, Des Moines, Ia. Not at all "official" looking. Heavy paper. Simple line cuts. Need not have used the shiny paper. *Free*.

Sex Education, by Edith D. Dixon. Extension Service, Rutgers University, New Brunswick, N. J. 8 pages. Seeks to bring about "a matter-of-fact attitude" and use of "the correct vocabulary." The few reading references all include publisher's address and price. For free distribution only in New Jersey, but single copies will be sent free to health workers elsewhere. Request privilege of re-publication.

The Early Care of Children's Teeth, by Dr. L. J. Stephan. Milwaukee Health Dept. 12 pages. From birth to 6 years. *Free*.

Some day this writer hopes for careful consideration of how to select subject matter for those who most need health information. Should the early care of children's teeth be presented in two parts? How about using "Save The Baby Teeth!" for the mothers of babies?

List of Publications, National Committee for Mental Hygiene, 450 7th Ave., New York, N. Y.

Some of the advance papers of the International Congress on Mental Hygiene are available at 15 cents a copy. Ask for copy of list. Two of them: Educational Techniques for Mental Hygiene Societies, and Public Education in Mental Hygiene.

Publicity Material. American Society for the Control of Cancer, 25 West 43d St., New York, N. Y. *Free*. A list of available material.

Children's Bureau and Other Publications Relating to Children. Supt. of Documents, Washington, D. C. *Free*.

List of government publications for sale.

Foods and Cooking. Supt. of Documents, Washington, D. C. *Free*. List of government publications.

Living The Healthy Life, by Dr. J. F. Williams of Teachers College. John Hancock Mutual Life Ins. Co., Boston, Mass. *Free*. A "health manual" of 12 pages for those who will accept a manual touching upon a dozen aspects of healthy living.

Health Education Material. Dairy-men's League Coöperative Assn., 11 West 42d St., New York, N. Y. *Free*. Illustrated catalogue of publications and other material.

Publications and Policy of Distribution. Cleanliness Institute, 45 East 17th St., New York, N. Y. *Free*. Classified, descriptive list of publications and how to get them.

Among the Cleanliness Institute publications: The Great East Gate, by Dr. W. W. Peter, and Hitch-hikers, by Dr. Peter and G. T. Hallock. All health educators may and should have copies. When you have read or used either of them please tell me what you think of it. Hitch-hikers offers many ideas for exhibits and illustrated talks.

Eating for Efficiency. Evaporated Milk Assn., 203 North Wabash Ave., Chicago, Ill. 64 pages. Menus, recipes, calories and mineral values of common measures of food. *Free*.

Health Education and the School Lunch, and Why Evaporated Milk? illustrate use of rough finished paper, silhouettes as illustrations, and black with one color in printing. Address above. *Free*.

Citrus Fruit Recipes For Special Diets. California Fruit Growers Exchange, Los Angeles. *Free* for training classes.

MAGAZINE ARTICLES

"The Gland Route to Health," by Dr. G. F. Alsop. *Woman's Journal*, New York, N. Y. Dec., 1930.

"I Smell Smoke," by T. F. Dougherty. *Saturday Evening Post*. Jan. 31, 1931. Fire hazards and prevention.

"What Rights Has the Child?" by Dr. W. R. Ramsey. *Farmer's Wife*. Feb., 1931. St. Paul, Minn. *Free*.

"Our Ageing Population: Its Vital Effects," by Louis I. Dublin. *New York Times*. Jan. 4, 1931. Diagram.

CONVENTIONS

"Public Health Education—The Function of the University and of Private Foundations—The Functions and Limitations of Government in Public Health" will be discussed by the Health Division, National Conference of Social Work, Minneapolis, Minn., June 19, 1931.

The Educational Publicity Division, National Conference of Social Work, Minneapolis, Minn., will discuss: "Education of the Public on Mental Hygiene—The Public Mind on the Private Mind"; "Lessons in Public Relations from the Year 1930—Old and New Stereotypes"; "The Child and Propaganda—The Conundrum of the Educator—The Problem for Child Guidance"; "The Lessons From Difficult Causes"; "The Radio and Social Work—Does the Public Listen In?—Who is Broadcasting—and What?"

At Minneapolis in June the Social Work Publicity Council program will include: "Review of 1931 Publicity Awards"; "Round Table on the Newspaper in Social Work"; "Outstanding Publicity Ideas of the Year"; "What's On Your Mind: Questions and Answers on Publicity Practice"; "Round Table on Annual Reports and Annual Meetings."

"A School Health Program in Relation to Tuberculosis of Children," by D. J. Kelly, and "Public Relations," by G. A. Hastings, will be features of the National Tuberculosis Association convention, Syracuse, N. Y., in May.

An evening session of the Pennsyl-

vania Tuberculosis Society annual meeting was devoted to "Education for Health." One of the 3 addresses was by Dr. H. E. Kleinschmidt of the Public Health Education Section. Another feature was a joint luncheon session with the local Rotary Club.

The White House Conference will be discussed in an afternoon session of the annual meeting of the Iowa Public Health Assn.

Report of Magazine Coöperation With White House Conference. Mimeographed report showing an immense circulation of Conference material. Professional journals do not show up so well, due, doubtless, to the scarcity of real fact material about the Conference. Most of the news releases told of conditions and problems, while public health workers needed to know more about the plans for the studies and the Conference.

DATES AHEAD

May 1—Child Health Day—Emphasis upon "an adequate school health program adapted to meet the needs of each community," and the "support of adequate full-time community health service," are urged as May Day—Child Health Day—themes by the Conference of State and Provincial Health Authorities. Address: American Child Health Assn., 450 7th Ave., New York, N. Y.

May 10—Mother's Day—Address: Maternity Center Assn., 578 Madison Ave., New York, N. Y. "A Day to Save Mothers' Lives"; "to direct the attention of the American people to our deplorable maternal death rate—the highest in any civilized country." 8 electrotypes, in different sizes, for newspaper use supplied free. Also press copy, 400 up to 1,200 words, including: "The Waste In Mothers' Lives"; "They Never Knew Their Mothers"; "A Square Deal for Mothers"; "Stork Worship." Other forms of publicity suggested for state and local groups.

Departments and associations may "cash in" on the national promotion of the "Day" under the leadership of the well known Maternity Center Association.

May 12—National Hospital Day—Address: National Hospital Day Committee, 537 S. Dearborn St., Chicago, Ill. Some of "the larger radio and national advertisers have promised co-operation." This of course is a long established and successful event.

WHY DO THEY DO IT?

A memorandum of health activities in a city, located east or west of Montauk Point, is headed

A Review of New Activities initiated or accomplished at . . . during the past ten months.

But the memorandum is not dated! Nothing but a real letter is dated—according to the average stenographic mind. The way to avoid trouble in filing and sending out undated material is to have an office rule that *all material* going through a typewriter shall be dated *unless* contrary instructions are issued.

A 4-page T.A.T. folder of special merit is issued by "the Health Department" in some unnamed city. Why the modesty?

PLAYS

A play for adults: My Son John, by Drs. L. F. Wooley and D. K. Pratt. National Committee for Mental Hygiene, 450 7th Ave., New York, N. Y. 10 cents. "A mental hygiene playlet about a normal child." First presented at annual meeting of National Congress of Parents and Teachers.

The Treasure of Healthy Harbor. *Hygeia*, 535 North Dearborn St., Chicago, Ill. Feb., 1931. 25 cents. Another "pirate" health play for the 7th grade.

"Let's Give a Play," by O. Schrottky.

American Girl, 670 Lexington Ave., New York, N. Y. Feb., 1931. 20 cents. Makes much of simple settings and costumes—to make it easier to "give a play" about health—or for health's sake.

In the same issue of *American Girl*, the Girl Scout magazine, will be found "Plays to Act and Read," by S. L. Goldsmith, and "How About Marionettes?" The latter introduces the idea of home-made puppets.

DIPHTHERIA

"The Results of the 5-Year Toxin-Antitoxin Campaign" (now closed) in New York State. State Dept. of Health, Albany. Free.

The "Diphtheria issue" of *The Commonwealth* (Massachusetts Dept. of Public Health) included "A Diphtheria Immunization Campaign—Organization and Methods." July–Sept., 1930. Free.

Emphasis for the 24-sheet diphtheria prevention poster was gained in Lafayette High School, Buffalo, by an unveiling in the school auditorium. Illustrated in *S. C. A. A. News*, 105 East 22d St., New York, N. Y. Jan., 1931.

A progress report of the New York City campaign based on "the economic loss caused by diphtheria"—a press release. New York City Dept. of Health. Free. Can be worked over in other cities or states.

Two different blotters and a small handbill—Health Dept., Attleboro, Mass. No "hard words." Tell the 3 or 4 facts most necessary to get understood. Free.

A press release on diphtheria carriers—New York City Dept. of Health. Free. Also "Eight children's lives saved each week"—press release. Free.

The Berwyn, Ill., American Legion Post was awarded the State Adjutant's Cup—"for the outstanding piece of service among the children in Illinois"—for its local campaign for diphtheria immunization.

BOOKS AND REPORTS

USEFUL BOOKS OF THE PAST YEAR

MAZŮCK P. RAVENEL, M. D.

IN this review we have not confined ourselves entirely to 1930, since several exceptional books dated 1929 were published late in the year and notices of them did not appear until 1930. Further, we omitted our 1929 annual review. We have limited ourselves almost entirely to books which will be of use to the public health worker in the many fields embraced under that title.

The classification has been somewhat difficult and under "miscellaneous," especially, will be found a number of works which might well be placed elsewhere. Works on bacteriology which include immunity, as practically all of them do, have been included under bacteriology.

While we have depended chiefly on reviews in our own columns, we have also consulted a number of leading American and English journals. Practically all the English publishers have agencies in America, some of which put out the books under their own names, so that they may be obtained as easily as those published here.

On bacteriology, we have three works of unusual value. The Medical Research Council of England is publishing *A System of Bacteriology in Relation to Medicine*, written by many authors, and published by His Majesty's Stationery Office. Several volumes have appeared during the year. For succinctness and accuracy of statement, as well as practical value, this is easily the most valuable work on this subject in the English language. Of equal value, as far as it goes, is *The Principles of Bacteriology and Immunity*, by Topley and Wilson,

William Wood. An excellent book on a subject too little known is *Molds, Yeasts and Actinomyces*, by A. T. Henrici, Wiley. The Pickett-Thompson Research Laboratories have issued Volumes V and VI on the *Pathogenic Streptococci*. Volumes II and III of *Physiology and Biochemistry of Bacteria*, by R. E. Buchanan and Ellis I. Fulmer, Williams and Wilkins, are important and of great interest. Very useful books are *A Compilation of Culture Media for the Cultivation of Microorganisms*, by Max Levine and H. W. Schoenlein, Williams and Wilkins, and *Bacterial Metabolism*, by Marjory Stephenson, Longmans, Green & Co. *The Bacteriophage and Its Clinical Application*, by F. D. d'Herelle, Charles C. Thomas, treats of a much discussed phenomenon. *An Introduction to Malarology*, by Mark F. Boyd, a master of the subject, Harvard University Press, is worthy of especial praise from every standpoint, and *The Geographical Distribution of the Malaria Carrying Mosquitoes*, by H. W. Kumm, *American Journal of Hygiene*, goes with it appropriately.

Immunology has, as usual, held the interest of laboratory workers as well as clinical men. The following can be recommended: *The Chemical Aspects of Immunology*, by H. Gideon Wells, Chemical Catalogue Company; *The Immunology of Parasitic Infections*, by William H. Taliaferro, Century Company; and *Immunity in Infectious Diseases*, by Besredka, Williams and Wilkins.

The laboratory worker will welcome

the third edition of *Laboratory Methods of the United States Army*, by Charles F. Craig, Lea & Febiger; and the 7th edition of *Lehmann's Medical Hand Atlases—Determinative Bacteriology*, Volume I, Translated by R. S. Breed, G. E. Stechert. *Laboratory Medicine*, by Daniel Nicholson, Lea & Febiger, is an excellent work, and though designed chiefly for clinical medicine, contains much of value to the public health worker. *The Report of Second Conference on the Sero-Diagnosis of Syphilis*, World Peace Foundation, is also of great practical importance.

Two outstanding books on water supply and sewage disposal have appeared: *Water Supply Engineering*, by Babbitt and Doland, McGraw-Hill; and *Sewerage and Sewage Disposal*, by Metcalf and Eddy, McGraw-Hill.

The output on personal, industrial, mental, sex and general hygiene has been large. Under this general heading we have included some books which might well have been placed elsewhere, because while their titles do not indicate that they are particularly devoted to hygiene, the authors have given much attention to prevention. The following have been selected as typical in their respective lines: *The Diagnosis of Health*, by William R. P. Emerson, Appleton; *The Hygiene of the School Child*, by Terman and Almack, Houghton Mifflin; *Hygiene for Nurses*, by Guy and Linklater, Wood; *Outline of Preventive Medicine*, Edited for New York Academy of Medicine, by Sondern, Heyd and Corwin, Hoeber; *A Textbook of Hygiene*, by J. R. Currie, Wood; *Military Preventive Medicine*, by George C. Dunham, *Army Medical Bulletin No. 23*; *Personal Hygiene for Nurses*, by Seneca Egbert, Davis; *The Principles and Practice of Hygiene*, by Smiley, Gould and Melby, Macmillan; *Artificial Sunlight—Combining Radia-*

tion for Health with Light for Vision, by M. Luckiesh, Van Nostrand; *Tuberculosis Among Children*, by J. A. Myers, Thomas; *Personal and Community Hygiene*, by C. E. Turner, Mosby.

Under industrial hygiene we have *Psychology and Industrial Efficiency*, by Harold Ernest Burtt, Appleton; *Incapacity or Disablement in Its Medical Aspects*, by E. M. Brockbank, H. K. Lewis; *Trauma, Disease Compensation—A Handbook of their Medico-Legal Relations*, by A. J. Fraser, F. A. Davis; *Is It Safe to Work? A Study of Industrial Accidents*, by Edison L. Bowers, Houghton Mifflin; and *The Human Factor in Industry*, by E. P. Cathcart, Oxford University Press. A new departure, useful to the laboratory man as well as the specialist in industrial hygiene, is *Industrial Microbiology*, by Smyth and Obold, Williams and Wilkins. There has been a great development in this subject since the World War, much of the material still being found only in technical journals.

Writers on sex hygiene have given us *Factors in the Sex Life of Twenty-two Hundred Women*, by Katherine Bement Davis, Harper; and *Sterilization for Human Betterment*, by Gosney & Popenoe, Macmillan.

On mental hygiene we cannot but single out *Introduction to Mental Hygiene*, by Groves and Blanchard, Henry Holt. This is a subject too little understood by the general physician and many books concerning it are written in language difficult for the average person to understand. This particular work has not only been very highly praised by specialists, but is written in language which makes all of its teachings available to the average reader. Other excellent books on this subject are: *Practical Psychology and Psychiatry*, 6th edition, by C. B. Burr, Davis; *Social Control of the Mentally Deficient*,

by Stanley P. Davies, Crowell; *The Adolescent: His Conflicts and Escapes*, by Schwab & Veeder, Appleton; and *Mental Deficiency*, 5th edition, by A. F. Fredgold, Wood.

In spite of the attention which oral hygiene has attracted for several years, as evidenced by the work in England, and the studies in America, some of which are under the Foundations, few books have appeared on the subject. We can recommend *Mouth Infections and Their Relation to Systemic Diseases*, by Malcolm Graeme MacNevin and Harold Stearns Vaughan, issued by the Joseph Purcell Research Memorial. From England we have a most valuable report, *Special Report Series, No. 140, Diet and the Teeth: An Experimental Study, Part I*, by May Mellanby; His Majesty's Stationery Office, published in November, 1929.

The social and economic status has much influence on health. We can recommend *The Social Worker in Family, Medical and Psychiatric Social Work*, by Louise C. Odencrantz, Harper.

The study of children from every standpoint has received an impetus through the studies made by the various committees of the White House Conference. Most of this material is not yet in book form and cannot be offered for some time to come. Two books have been recommended by the reviewers: *Creative Activities in Physical Education*, by Olive K. Horrigan, A. S. Barnes; and *Baby's First Two Years*, by Richard M. Smith, Houghton Mifflin.

Epidemiology is represented by the following: *Epidemic Encephalitis—Report of Survey by Matheson Commission*, Columbia University Press; *Undulant Fever and Contagious Abortion*, by L. C. Bulmer, Technical Service Bureau; *Diseases Transmitted from Animals to Man*, by Thomas G. Hull, Charles C. Thomas; and *The Epidemiology and Control of Malaria in Palestine*, by I. J.

Kligler, Chicago University Press. The work on encephalitis does not arrive at any conclusions because the disease offers many problems which are as yet unsolved, but we know of nothing which contains anything like the amount of information on the subject that this report gives.

Two unusually good books on tuberculosis, especially the relation of the disease in animals to human beings, deserve attention: *Tuberculosis in Man and Lower Animals*, by H. H. Scott, His Majesty's Stationery Office; and *The Prevention of Human Tuberculosis of Bovine Origin*, by William G. Savage, Macmillan.

There have been a number of short books on various aspects of food and feeding from which we have selected: *Feeding the Family*, 3d edition, by Mary Schwartz Rose, Macmillan; *Deficiency Diseases, Including Osteomalacia and Tetany*, by Alfred F. Hess, Lea & Febiger; *The Most Nearly Perfect Food: The Story of Milk*, by Crumbine and Tobey, Williams and Wilkins; and *Grow Thin on Good Food*, by Luella E. AxteLL, Funk & Wagnalls.

Parasitology is well represented by: *A Manual of External Parasites*, by H. E. Ewing, Charles C. Thomas; *Hookworm Disease, Its Distribution, Biology, Epidemiology, Pathology, Diagnosis and Control*, by Asa C. Chandler, Macmillan; *Insects, Ticks, Mites and Venomous Animals of Medical and Veterinary Importance*, by Patton and Evans, H. R. Grubb, Ltd.; *Introduction to Human Parasitology*, 4th edition, by Asa C. Chandler, Wiley (replacing *Animal Parasites and Human Diseases*); and *Handbook of the Mosquitoes of North America*, by Robert Matheson, Charles C. Thomas.

Tropical Medicine is represented by: *Tropical Medicine*, by Rogers and Megaw, Blakiston, based on the extensive experience of the two well known

men in the tropics and original in arrangement and treatment; and *Tropical Medicine in the United States*, by Alfred C. Reed, Lippincott.

Several excellent biographies and autobiographies have appeared of which the following are of especial value: *Medical Leaders from Hippocrates to Osler*, by Lambert and Goodwin, Bobbs-Merrill; *Harvey W. Wiley*, Bobbs-Merrill; *Edward Jenner and the Discovery of Smallpox Vaccination*, by Louis H. Roddis, published by the author; and *Health Heroes. Edward Livingston Trudeau*, by Hallock & Turner, Heath. The most notable biography in many ways is *The Book of My Life*, by Jerome Cardan, translated from the Latin by Jean Stoner, E. P. Dutton. Cardan was a remarkable character from many standpoints, the leading physician of his time as well as a great mathematician. His character was full of apparent contradictions, and his story has now for the first time been made available to the average reader. *Plarr's Lives of the Fellows of the Royal College of Surgeons of England*, by Sir D'Arcy Power, John Wright & Sons, gives the histories of many famous discoverers of medical facts.

Many books must be classed under "Miscellaneous," some of these written for the public in nontechnical language, but containing material which the average health worker and physician will appreciate. Some of the outstanding are: *Health—What Everyone Ought to Know*, by Oliver T. Osborne, Thomas; *Disease and the Man*, by George Draper, Macmillan; *The Art of Rapid Reading*, by W. B. Pitkin, McGraw-Hill; *The Story of San Michele*, by Axel Munthe, Dutton; *The Biological Basis of Human Nature*, by Jennings, W. E. Norton; *Getting Well and Staying Well—A Book for Tuberculous Patients, Public Health Nurses and Doctors*, by John Potts, Mosby; *Science in the Service of*

Health, by Elliot R. Downing, Longmans, Green and Co.; *Pioneers of Public Health—The Story of Some Benefactors of the Human Race*, by M. E. M. Walker, Oliver & Boyd; *Practical Medical Dictionary*, 11th edition, by Thomas Lathrop Stedman, Wood; *The Development of Physiological Chemistry in the United States*, by Russell H. Chittenden, The Chemical Catalogue Company; *Dietetics in Warm Climates*, by J. Neil Leitch, Robinson & Sons; *Allergic Diseases*, by Ray M. Balyeat, Davis; *Seventy Birth Control Clinics*, by Caroline Hadley Robinson, Williams & Wilkins; *Civilization and The Cripple*, by Frederick Watson, John Bale, Sons & Danielson; *History of Haitian Medicine*, by Robert P. Parsons, Hoeber; *Human Biology and Racial Welfare*, by E. V. Cowdry, Hoeber; *Medicine, Its Contribution to Civilization*, by E. B. Vedder, Williams & Wilkins; and *Recent Advances in Preventive Medicine*, by J. G. C. Haslam, Blakiston. *The Money Value of a Man*, by Louis I. Dublin, Ronald Press, shows the useless loss of wealth by premature deaths. Without wishing to appear partial we cannot but call especial attention to *The Story of San Michele*, which is largely an autobiography, as one of the most remarkable books which has been published during the year. Its popularity and human interest is attested by the fact that 30 reprints were printed in 12 months.

On the legal side, we note *A Survey of the Law Concerning Dead Human Bodies*, by G. H. Weinman, National Academy of Science, which is of interest to many classes of readers; and *The Doctor in Court*, by Edward Huntington Williams, Williams & Wilkins.

At a time when athletics is being so widely discussed, the *Symposium on Physical Education and Health*, edited by Jay B. Nash, New York University Press, will be found most useful. An-

other good book is *Handbook of Physical Education*, by E. G. Schroeder, Doubleday, Doran.

Lastly, *Blood Grouping in Relation to Clinical and Legal Medicine*, by L. H. Snyder, Williams & Wilkins, calls for attention. Written largely from the biological standpoint, it contains facts of general and practical interest.

Medical Biometry and Statistics—

By Raymond Pearl. (2d ed rev.) Philadelphia: Saunders, 1930. 459 pp. Price, \$5.50.

The word "statistics" seems destined for a place in the lists of words of greatest usage which lexicographers compile in their idle moments. The world has long known the power of the printed word; now it may come to recognize the even greater effect of a statistical formula.

When, in 1923, Raymond Pearl published his *Introduction to Medical Biometry and Statistics* he made available to public health workers all the well tested procedures which a medical statistician is ever likely to employ. Now we have the second, completely revised and enlarged edition of this valuable work. Pearl has wisely omitted certain topics of purely theoretical interest, such as his Classification of the Causes of Death for Research Purposes. He has added much useful material dealing with the preparation of record forms and their tabulation, a new chapter on the logistic curve, and, as part of Chapter I, a new section on the Nature of Statistical Knowledge. This section will repay the most attentive reading even by a trained statistician.

There is great temptation to quote from it freely, but space will permit of but one sentence: "Very likely some will not agree with its reasoning or its tentative conclusions, but even in such event, it may help the disagreeing reader to the more complete ordering of

his own ideas about statistical concepts."

This observation illustrates what the reviewer considers as Pearl's greatest contribution to the field of biometry. His work has frequently called forth the expression (at times, violent) of opposing views. The important point is that were it not for his prolific researches it probably would not have occurred to many of his opponents to investigate the disputed subjects at all.

The book is thorough and exact in statements of fact, stimulating and open-minded in interpretation. The changes in the new edition have made an excellent book even more meritorious.

J. V. DEPORTE

The State Departments of Massachusetts, Michigan, and Ohio—*By James Wallace, M.D. (Sponsored by the Committee on Administrative Practice, American Public Health Association.) New York: Commonwealth Fund Division of Publications, 1930. 192 pp. Price, \$1.50.*

Dr. Wallace has made a detailed study of the state health organization of 3 states having an approximately equal population. These states were well selected, in that each represents a somewhat different type of population, having varying governmental procedures and traditions. Each state has an active health service, with wide divergence of viewpoint in relation to general policies.

The book begins with a short chapter on the origin and present form of the 3 state health departments. Local health organization in each state is considered briefly, and there is a short chapter on appropriations and expenditures. The author has not considered each state separately, but has divided the book in accordance with the functions of a state health organization and has summarized the activities of all in relation to each separate function.

For example, tuberculosis control (p. 81) is treated in a short chapter. The activities of each of the states in relation to tuberculosis control are outlined. The author makes no comparisons, but the material is suitably compiled, so that the reader can make his own.

In the final chapter, the author gives a brief critical statement in regard to the organization, activities, and policies of the states under consideration.

The appendix gives the *Appraisal Forms* for rural and municipal health service as adopted by the American Public Health Association. These forms are inserted "for those who may wish to measure the achievement of the three state health departments." Since these *Appraisal Forms* relate to local health organization they have little utility as a means for measurement of achievement of state health work.

Students of state public health administration will secure much information from a careful study of Dr. Wallace's book. WILSON G. SMILLIE

Study Guide Test-Book in Hygiene
—By Dean Franklin Smiley, Adrian Gordon Gould, and Elizabeth Melby.
New York: Macmillan, 1930. 70 pp.
Price, \$.80.

This test-book is designed as an aid in the preparation of lesson assignments based on *The Principles and Practice of Hygiene*, designed largely for nurse training. There are 26 sections or sets of lesson questions arranged in such a way as to cover 30 class hours.

The test content is made up of various types, some of which are ordinary questions requiring a written answer, others problems of which the following is a sample:

The following situations have been reported:

a. A 10-year-old child is living in the same home with a 6-year-old brother who has tuberculosis of the knee.

b. A child was born of a mother with ad-

vanced pulmonary tuberculosis but was at once placed in the home of a healthy relative.

c. A 14-month-old child is with its mother who is an active uninstructed case of pulmonary tuberculosis.

d. An 8-year-old child is living in the same home with its father who 10 years before returned from a modern tuberculosis hospital as an arrested case of pulmonary tuberculosis and has had no symptoms since.

List these situations (by their corresponding letters) in the order of their importance to the exposed child:

1.....2.....3.... 4.....

There are also questions of a type similar to the "True and False" but containing a sufficient number of statements regarding a given case so that they are a real test of information.

While at first glance such a scheme seems somewhat mechanical, it does cover the ground in a thorough way and has distinct advantages as a guide to the teacher of the class in hygiene. One objection would be, of course, that after it has been used a year or two, the lazy student will get the proper answers from some one who has previously taken the course. On the whole, this is a desirable addition to the technic of teaching hygiene. CHARLES H. KEENE

Seventy Birth Control Clinics. A Comprehensive Survey and Analysis which Includes the General Effects of Control on Size and Quality of Population. The Nature, Extent and Status of a World-wide Movement Objectively Presented. First of a Series of Monographs on the Medical Aspects of Human Fertility Published under the Auspices of The National Committee on Maternal Health—By Caroline Hadley Robinson. Baltimore: Williams & Wilkins, 1930. 351 pp. Price, \$4.00.

The title and subtitle of this book describe it as well as any review can. It is a piece of work which has been conscientiously done, with the advice of

notable men and women, and can be regarded as an authoritative exposition of the subject as it now stands.

Chapter X which treats of the benefits which may be expected will probably strike the average reader as being too optimistic. If these could be reasonably assured, those who believe in birth control would have enormous accession to their ranks.

The book is well printed, well documented and has a good index. There are several useful appendixes.

M. P. RAVENEL

Grow Thin on Good Food—By Lucilla E. Axtell, M.D. New York: Funk & Wagnalls, 1930. 336 pp. Price, \$2.00.

The problem of reducing is largely one of will power and practical knowledge of the nutritive values of food and the essential needs of the body. The author makes her reader face the situation at the outset: "You cannot run away from a weakness; you must sometime fight it out or perish." But she also holds up visions of the gains to the victor—improved health, better looks, and freedom from the "humiliation, dejection and shame of being fat." Excellent advice is given in a very simple, entertaining fashion, always with the plea for intelligent mastery. "Anyone, no matter how stupid, can follow an 'Eat this' system but to look into the subject intelligently requires brains, brains and character."

About two-thirds of the book is devoted to proper food and one-third to proper exercise. There is very practical advice about the selection of food, for instance choosing meat as free from fat as possible, making veal the staple meat because of its leanness, cooking it occasionally in the water from boiled ham for "near ham."

There are recipes which use attractive ways such non-fattening aids as

washed bran, India gum, agar-agar, mineral oil, and saccharine. A program of pleasing and original meals for a month, including measures and recipes, provides for a woman 5 feet 4 to 4½ inches tall, with modifications for others of greater height. Programs with plainer foods, programs for men, and for those who must eat what is served, indicate the careful efforts of the author to meet varying needs.

Instruction regarding exercise is also sane and practical, emphasizing the importance of regularity and the value of play rather than drudgery.

There are some inaccuracies, such as the statement that adults need little vitamin A, and that whole wheat, peas and beans may be regarded as sources of this very important factor. Some provision of cod liver oil or one of its concentrates to insure a high vitamin A intake would seem desirable. It is regrettable that lean meat should be recommended as a source of vitamins, when it is of almost negligible value save for vitamin G, while liver, with its high vitamin content, is given no emphasis. The substitution of the common yeast extracts rich in vitamin B for bouillon cubes with practically no nutritive value would be in line with the author's aim to keep the supply of vitamins high. On the whole the book is a most welcome popular interpretation of the way in which reducing may be accomplished on truly good food, attractive in form and flavor as well as a means to health, beauty, and happiness.

MARY S. ROSE

Safety Town Stories—By Mildred Miles Roberts. Chicago: Lyons & Carnahan. Price, \$.60.

In this story book for boys and girls, ages not stated, Sally Safe is a girl who always does the careful thing, looks before she leaps, washes her hands before she eats, gives penny lectures to her

sister Susie Sorry, who, as you may have guessed, always does the wrong thing and reaps the inevitable consequences of her carelessness. To the adult mind, the stories are simply appalling, but undoubtedly to the child they are as natural and as absorbing as the so-called funnies are delightful.

Who can tell whether reading these stories will cause children to be more cautious, to abstain from dangerous pastimes? Is caution an entirely desirable trait? Probably only good results from the reading, but it is possible that the more sportingly inclined youngster might try to do Susie Sorry one better just to see what would happen.

Health workers with a flair for child behavior might put the book to the test. It is attractively printed and illustrated, and ought to be most acceptable to children.

RAYMOND S. PATTERSON

Strategy in Handling People—By *Ewing R. Webb and John J. B. Morgan*. Chicago: Boulton, Pierce, 1930. 260 pp. Price, \$3.00.

The question may well be asked why this book should be noticed in these columns. It is not a public health book, and moreover it can hardly be designated as scientific; yet it contains a vast amount of practical information directly applicable to the daily task of the health executive.

Many a health officer has discovered to his surprise that his success in inaugurating and developing an effective health program depends less on his technical knowledge and scientific training, which he has perhaps systematically labored for years to acquire, than on ability to get appropriating bodies and influential individuals to give him the necessary practical support. This ability which is generally assumed to be an intuitive trait of personality or acquired without special study is here revealed to be susceptible of development by the process of learning.

It is a textbook on successful human relationships. There is little that is new in it and the scientific principles of psychology have been indicated in only the slightest degree to substantiate its empirical presentation. The authors have, however, rendered a valuable service in classifying some 20 or more types of ordinary business, diplomatic and political relationships and illustrating by concrete examples how they have been successfully handled by eminent persons. The conversational style in which the incidents are elaborated makes the book easily readable.

It is remarkable to note in a book on this subject that among the hundreds of illustrious personages used as examples, the only woman is Evangeline Booth. Over three hundred references are given, most of which are to biographies.

A careful study of this book by public health workers and the skillful application of its principles with the right people should increase public health facilities far beyond those which have been attained by preachment, persuasion, publicity and politics. No indication is given as to what will happen when everybody has learned the lessons given and we all "strategically" handle each other.

HOMER N. CALVER

A Manual of the Common Contagious Diseases—By *Philip Moen Stimson, M.D.* Philadelphia: Lea & Febiger, 1931. 351 pp. Price, \$3.75.

This manual is the outgrowth of notes on lectures given at the Cornell University Medical College. It is intended primarily as a clinical guide for medical students and internes, though the author expresses the hope that it will be found useful for nurses and practitioners of medicine, especially those engaged in school work.

It is well written, up-to-date, and gives all of the facts concerning etiology, symptoms, treatment, prevention, and the protection of contacts, which is re-

quired. There is a glossary which should not be needed for those capable of understanding the text, and a useful table giving a summary of the most common contagious diseases.

The chapter on General Management of Contagious Diseases, which includes the technic and rules practised at the Willard Parker Hospital, with which the author is connected, is most useful. The illustrations are excellent.

It strikes us as being one of the best of its type which has come to our attention. It can be unhesitatingly recommended. The printing and make-up are excellent.

M. P. RAVENEL

Tests and Measurements in Physical Education—By *John F. Bovard and Frederick W. Cozens*. Philadelphia: Saunders, 1930. 364 pp. Price, \$2.75.

This is an outstanding contribution to the scientific side of physical education. It discusses the need and use of physical tests; gives a historical sketch concerning the development of measurements in physical education; and discusses in considerable detail the typical contributions in the field, covering such factors as anthropometric measurements, strength tests, cardiac functional tests, ability and adjustment tests for elementary and secondary schools, and for colleges for both men and women. It includes also tests on neuromuscular control, and those using sport technic as a measuring rod.

There is an excellent section on tools of measurement covering such factors as elementary statistical methods, graphical methods, and methods of scoring tests. There is a third section on the theory and practice of test administration.

An excellent bibliography in the field of physical tests and measurements, and an appendix made up largely of tables necessary for scoring certain outstanding tests end the book.

While this book is an expansion and a rearrangement of a University of Oregon publication by the same authors issued in 1926, it is much more complete, and much better arranged.

This excellent contribution does for physical education what so many other authors have endeavored to do for other types of education.

CHARLES H. KEENE

Ethics Talks to Nurses—By *Mary E. Gladwin*. Philadelphia: Saunders, 1930. 281 pp. Price, \$2.00.

The more one deals with nurses the more he is impressed with the important part good nursing ethics plays in their professional success. And since ethics means the science of duty or of conduct from the standpoint of right or wrong it is absolutely fundamental.

The author displays rare common sense and a fine insight into psychological principles. For instance, sentences like these ring true: "Nervousness is often a form of selfishness," and "A good deal is said about the necessity for *self sacrifice* on the part of nurses when what is really meant is *self control*."

Every point made in the book is well illustrated by a concrete example which is obviously drawn from long experience in nursing practice and nursing teaching. The chapter on "The Patient and the Nurse" is especially good. Miss Gladwin shows here that many nurses show no lack of skill or technical knowledge yet they fall short of being true nurses by displaying little mannerisms and habits which might be put under the heading of bad manners. She shows that the first duty of the nurse is to study and know herself and subject herself to rigorous self discipline so that she may have the poise and delicacy of touch and feeling which contribute to the art of nursing.

Some of the chapter titles are Observation, Gossip, Truth, Discipline,

Punctiliousness, The Opposite Sex, Good Manners, Fees and Gifts, Vocabularies and Books, and Success. The last chapter, entitled *Our Exemplar*, constitutes a rare climax; it is really the most unique and beautiful thing about the book, for *Our Exemplar* is none other than Florence Nightingale herself. One has only to read of her life and character to know that she epitomized all our ideals of nursing ethics.

Miss Gladwin's little book deserves to be widely used not only in nursing schools but among graduate nurses, who will emerge not only better nurses but better women after spending an hour or two immersed in its pages.

EVA F. MACDOUGALL

Laboratory Medicine. A Guide for Students and Practitioners—*By Daniel Nicholson, M.D. Philadelphia: Lea & Febiger, 1930. Price, \$6.00.*

This is justly called a guide for students and practitioners. It does not contain all the various tests found in some of the older and more voluminous texts, but gives briefly and clearly the various laboratory procedures of proven value in the diagnosis of disease. It shows a real effort to explain the rationale of and indications for the various diagnostic procedures described, this being one of the most valuable features of the book, especially to the student.

There are included some of the newest diagnostic tests which heretofore have been found in various journals, as the biological test for pregnancy of Ascheim and Zondek, newer methods for investigation of the gastric secretion by the hypodermic injection of histamine, and the use of blood grouping in cases of disputed parentage. Other important sections are found on classification of anemias; recent views on hematology; classification of nephritis with the typical urinary findings in each

type; use of convalescent serum in treatment of measles and poliomyelitis; cutaneous reactions to proteins; and rapid microscopic tissue examination of Terry.

Some omissions are noted, as the recent work of Sabin on the rapid method of typing pneumococci, the value and utility of which is well established, the examination of skin lesions for blastomycetes and sporothrices, the Kahn tests for brucellosis and tularemia. The test for non-protein nitrogen is not given, since the blood urea nitrogen has the same significance. The wisdom of including therapeutic hints in a volume of this sort is probably open to question in principle.

We hope that these minor defects will be remedied in a second edition. In the meantime it can be said that this is one of the best of books on its subject. The printing, illustrations and make-up are excellent.

LOUIS F. HOWE

Annals of the Pickett-Thomson Research Laboratory. The Pathogenic Streptococci. Vol. 6. The Role of the Streptococci in Scarlet Fever—*By David Thomson and Robert Thomson. Baltimore: Williams & Wilkins, 1930. 470 pp., 13 pl. Price, \$10.00.*

A careful survey of the vast literature on scarlet fever is presented in this volume of the series on the streptococci. Fortunately the authors have devoted the entire volume to scarlet fever, reviewing published work in some 1,400 papers. Due to the discovery of the Dick toxin and the Dick test, researches during the past 5 years have been greatly stimulated and this entire field is here carefully presented. (For a full account of the various researches on the etiology of scarlet fever up to the year 1924 the reader is referred to Volume I, pages 115 to 172 of this same series.)

The bacteriology, immune reactions, diagnosis, infectivity, modes of trans-

ference, and complications of scarlet fever, as well as such problems as are presented, for example, by carriers, are presented in a manner which is clear and unbiased and will permit the reader to form his own conclusions. An example of the variety is found in studies on the spread of scarlet fever by books. It has been found that, under experimental conditions, *Streptococcus scarlatinae* will survive on inoculated books and can be recovered from them during a period of 4 weeks.

Probably the most immediately helpful part of the monograph, apart from the preface, is the authors' summary and conclusions. Fifteen points are presented which appear as different lines of proof that scarlet fever is caused by a specific hemolytic streptococcus, called the *Streptococcus scarlatinae*. By means of sugar tests, litmus milk test, and the iodine test *S. scarlatinae*, *S. erysipelatis*, *S. puerperalis*, and *S. pyogenes* can be differentiated.

This monograph is a tribute to careful editing and printing. Excellent plates of photographs and a careful index add to this distinctly valuable contribution to our literature on the streptococci. ESTHER W. STEARN

The Guidance of Mental Growth in Infant and Child—By Arnold Gesell. New York: Macmillan, 1930. 317 pp. Price, \$2.25.

Dr. Gesell, in this new volume, has brought together, in a number of brief chapters, many phases in the growth and development of the child. The historical backgrounds are delightfully sketched so that one may follow step by step the ideas and methods adopted in our guidance of the child. The most unique chapter is entirely pictorial, being made up of reproductions of fascinating engravings by Currier and Ives, illustrating child life in the early 19th century. It gives one a sense of the great distance we have travelled in child

welfare since the Victorian era. The latter part of this same chapter sets forth a series of photographs relating to child development and child guidance, taken in the observatory playground of the Yale Psycho-Clinic. Here one may study the child as he really is, untrammelled by adult modes.

The chapters on the history of the kindergarten in relation to its new rôle, and the growth of the nursery school movement point out the differences in the English and American organizations, and give an excellent evaluation of their functions. Part II presents problems and methods of child guidance, illustrated by the results of Dr. Gesell's measurements of observations of the mental growth of the child, which bear out his thesis that differences in mental reactions may be studied and measured early in the first year and that these differences project themselves into the later years. The chapter on accidental deaths of young children is timely and practical.

Part III gives an excellent brief sketch of the science and protection of child growth in which the relation of heredity to mental growth is concretely set forth.

Perhaps the most signal value of this book is the orientation it gives to the whole subject and the stimulus to further research. It is thought provoking. Dr. Gesell, always the investigator and inspiring teacher, reveals his many-sided interests here. R. A. BOLT

A System of Bacteriology in Relation to Medicine. Vol. VII. Virus Diseases, and Bacteriophage—The Medical Research Council. London: His Majesty's Stationery Office (Distributed in the United States by The British Library of Information, French Bldg., 551 Fifth Ave., New York), 1930. 509 pp. Price, \$6.00.

The Introductory Survey (Chapter I), written by W. E. Gye and J. C. G.

Ledingham, presents problems as to the nature of viruses. Their study shows them to possess few peculiarities other than dimensional, which mark them off unequivocally from visible microbes, though the inclusion bodies in cells noticed in a number of virus diseases should be emphasized, because so far it has not been possible to produce similar structures by means other than the particular virus.

Recent investigations by Hadley, and other American workers, on the filtrable stages of well known organisms suggest that the final word as to the distinguishing differences between viruses and bacteria has not been written.

The difficulties encountered in culturing viruses in the absence of living tissue closely parallel those met in the slow and gradual growth of the filtrates of certain ontogenetic forms of bacteria, though for the latter the presence of living tissue is not a requirement. The authors of this chapter feel that the onus of proof rests on those who suggest that viruses are not living entities but ferments or enzymes. The known facts supporting the various ideas as to the nature of viruses are briefly discussed.

Chapter II, on cell inclusions, is concluded with instructive suggestions as to methods whereby our present unsatisfactory knowledge may possibly be improved by "illuminating facts."

The greater portion of the book is devoted to a consideration of specific virus diseases of plants and animals, particularly the latter. Chapters are written by various authors and there is considerable diversity in the method of presentation. Thirty-six pages are devoted to bacteriophage and cognate phenomena.

To each chapter references are appended. It is to be regretted that an index is missing, for a table of contents may serve a student while at school, but an index is requisite for the ready ref-

erence demands of those in advanced and research work.

Volume VII of the *System of Bacteriology*, written under the auspices of the Medical Research Council of England, may be rightfully considered as particularly stimulating to research. Few problems in medicine are more provocative of thought and subsequent research than are those relating to the virus diseases and the bacteriophage. There has never been so urgent a call for complete coöperation of the many branches of biological and physical sciences in bacteriological research as in the present epoch making but chaotic time. These volumes are welcomed for their clear presentation of at least a large part of the knowledge of medical bacteriology, much of which is in the experimental stage.

ESTHER W. STEARN

The History of Physical Education in Colleges for Women—By Dorothy S. Ainsworth. New York: Barnes, 1930. 116 pp. Price, \$2.00.

This is a very much worthwhile effort to trace the development of physical education in 12 of the oldest colleges for women, with a brief introductory chapter sketching the development of physical education in the United States.

The chapters cover such problems as the development of the theory of physical education for women; the growth of the programs; the gradual installation of equipment; the number and types of activities of the staffs; the departmental organization used; the organization and activities of athletic associations; and the gradual modification of costume up to the present one permitting freedom of movement.

Summarized, the author concludes that the most outstanding responsibilities of the physical education department are: (1) to ascertain the physical condition of each student; (2) to pre-

sent a program which will meet the need of each student, taking into consideration her differences of individuality, skill, and vitality; (3) to give the student sufficient skill and interest in some activity to make probable the continuance of this activity both in and after college; (4) to offer the student situations in which she may express and develop her own ideas; (5) to have a program which in the eyes of the majority of the students is reasonable and interesting; and (6) to stress consistently definite standards of conduct.

Thoroughly trained teachers with high ideals are essential to the success of such a program.

CHARLES H. KEENE

Ergebnisse der gesamten Tuberkuloseforschung—Herausgegeben von H. Assmann, Leipzig; H. Beitzke, Graz; H. Braeuning, Hohenkrug-Stettin; St. Engel, Dortmund. Vol. 2 (Leipzig, Georg Thieme), 1931. 490 pp., 106 figs. Price, M. 45 bound.

The second volume of this monograph by specialists on the various phases of tuberculosis has 10 sections dealing mainly with the disease, its acquisition, pathology, detection, and treatment. The opening chapter by Dr. Blumenberg of Berlin is, however, devoted to the much contested question as to whether or not there is an invisible or filterable form of the tubercle bacillus. He concludes that overwhelming proof of the existence of an ultra-visible TB-form is still lacking, though evidence for its polymorphism is incontestable.

The pathological anatomy of apical tuberculosis of the lungs is described and figured by Drs. Loeschke and Dehoff. An interesting review and discussion of extra-domiciliary infection is given by Dr. Ickert, who notes that the earlier categories of classification of the sources of infection are, in the light of current

knowledge, no longer adequate, and, moreover, that statistical data as usually obtained have less critical value than single fully investigated cases. Factors such as the hereditary disposition or constitution, and the extent, rate, and sequence of infections, enter into and complicate the problem of separating the domiciliary from the extra-domiciliary origin of tuberculosis.

Studies made by Ickert in East Prussia on 994 infected children show the highest percentage of infections (19.7 per cent) to have had their origin from tuberculous teachers. Next in order (17.3 per cent) were infected school children, (15.1 per cent) members of the family, (9.5 per cent) children of families in which active tuberculosis was present, (8.8 per cent) unknown, (8.1 per cent) other members of the household, (4.9 per cent) business and professional contacts, (4.2 per cent) visiting relatives, (4.2 per cent) visiting children from tuberculous families, and (only 0.4 per cent) from tuberculous cows.

Other chapters deal with sanatoriums for the tuberculous, selection of patients for treatment, clinical concepts of tuberculosis in the light of the French investigations, mineral metabolism and water turnover in tuberculosis, artificial bilateral pneumothorax, prognosis in tuberculosis in children, and the anatomy, radiology, and clinical significance of interlobar clefts.

The book has full bibliographies and an author and subject index.

C. A. KOFROID

Problems in Contemporary County Government—By Wylie Kilpatrick, Institute for Research in the Social Sciences, University, Virginia, 1930. 666 pp.

A comprehensive survey of the process of county administration in the State of Virginia is presented in this volume.

Each of 7 main divisions is devoted to an essential aspect of county government, including functions, finance, area, personnel, physical plant, relationship, and management.

Under the coöperative health units are outlined: (1) the definition of the county health board and accompanying organization, (2) the division of responsibility between the state and county, (3) the staff attached to the county health agency. The county health agencies include in their functions such vital factors as the registration of vital statistics, tuberculosis control, sanitary engineering, social hygiene, hospitals and laboratories, child welfare, and education.

The public welfare organization has as its manifold functions the relief of the poor in institutions and homes, the study of child welfare and mental hygiene, hospitalization of defectives, and the care of the delinquents.

Under county and rural planning are considered the systematization of highways and roads, regulation of traffic, erection of billboards, regulation of use of land, park system, recreational facilities, conservation of natural resources, and the promotion of reforestation.

Part II treats of the problem of finance or the operation of the county financial process. The economic appraisal includes values, topography, soil composition and quality of lands, use and productivity, fertility, water supply and natural resources, and accessibility to transportation and markets. Statutory provisions and administrative agencies are considered. The various processes requiring coördination consist of taxing power and raising of revenue, use of credit, selective process of officials, enactment of legislation, and issuance of administrative rules. The term "town-county-government," representing the local governing process of Virginia

towns, comprises all municipalities in the state below 5,000 in population. Except for a few special districts, as the sanitary district, the town is the one unit of local government with which the county uniformly maintains close relations throughout the state.

A commendable feature of the survey is its frankness; it discusses failures as well as successes. The material, with rich statistical evidence, is well presented; the type is clear and readable; and the subdivisions are logically captioned.

IRA V. HISCOCK

Through Early Childhood—The Care and Education of the Child from Three to Nine—By Arthur Whitefield Spalding and Belle Wood-Comstock. Mountain View, Calif.: Pacific Press Publishing Assn., 1930. 344 pp. Price, \$2.00.

This book is Volume Three of the five volume set of *The Christian Home Series*. The others are: Vol. I—Makers of the Home (General; for youth, the newly married, and parents); Vol. II—All About the Baby (Infancy—first 2 years); Vol. IV—Growing Boys and Girls (Pre-adolescence—10 to 13); Vol. V—The Days of Youth (Adolescence—14 to 20).

The authors' plan calls for study during each of the months of the year, the book being divided into 12 sections of 4 chapters each. In general, the first chapter in each section deals with government and environment, the second with nature study, the third with health, the fourth with social and religious training.

At the end is an appendix containing questions relating to the text, and problems for study and discussion; an index; and a bibliography.

This book is designed primarily for parents. It might well have borne, as a title, "Through Early Parenthood." It would have value too for elementary

school teachers and for young adults. It has throughout a strong religious and ethical content. In general it covers such factors as mental hygiene, sex education, nature study, cleanliness, nutrition, and the treatment in the home of simple ailments.

This is a valuable text, particularly for young parents. The information is given in a very interesting way, and is definite and simple enough in content and procedure to be really usable. An unusual production of a type quite different from the ordinary text on health teaching and child training.

CHARLES H. KEENE

Allergic Diseases. Their Diagnosis and Treatment—*By Ray M. Bal-yeat, M.D., F.A.C.P. Philadelphia: Davis, 1930. Price, \$5.00.*

The present volume was first issued in 1926 under the name "Hay-Fever and Asthma." In this edition the name has been changed and considerable new material has been added, particularly in methods of determining the cause of allergic conditions other than hay-fever and asthma, such as eczema, migraine, urticaria, and certain forms of mucous colitis.

The book is pleasantly written and is useful for the sufferer as well as the physician. It is abundantly and well illustrated. The fact that it has gone through three editions in approximately 4 years shows that it has a place and has given satisfaction. This last edition will be found even more useful than its predecessors. M. P. RAVENEL

L'Hygiène Publique en France—*By A. Landry. Paris: Librairie Félix Alcan, 1930. 173 pp.*

The book contains a chapter on maternity and infancy welfare work in France. As one of the most important measures for the welfare of mothers, the author points out the law of 1913, amended several times since, which pro-

vides for all women of small means a cash benefit paid from public funds for 4 weeks before and 4 weeks after confinement. A nursing benefit is also paid for 12 months, if the woman nurses her child. The number of women receiving these benefits has been greatly increased since the enactment of the social insurance law early in 1930.

Infant health centers are maintained by the municipalities as well as by private organizations.

The custom of placing out children with wet nurses is very prevalent in France, and a law has been in existence since 1874 which provides medical supervision over all such children. However, the administration of this law has been often criticised; it has been charged that the midwives and the parents often fail to make the necessary report to the authorities and thus escape supervision, and the examining physicians fail to carry out their duties properly.

Other chapters describe the organization of public health work in France and the teaching of hygiene in public schools. IRA V. HISCOCK

The Development of Physiological Chemistry in the United States—*By Russell H. Chittenden. American Chemical Society Monograph No. 54. New York: Chemical Catalog Co., 1930. 427 pp. Price, \$6.00.*

The author is in a singularly advantageous position to undertake this presentation. One might almost say that he officiated at the birth of physiological chemistry in the United States, and has been a directing force throughout its development. In his treatment two interrelated themes are carried along together through the work; one a history of the development of organized activity and personnel, the establishment and growth of laboratories, and the training of men competent to undertake productive scholarship in this field; the other

a history of the problems attacked and the results obtained by the various groups of workers. The latter phase is the more important contribution of the work. The development of the two themes is not entirely parallel, but they interlace and each augments interest in the other, though it is true that such treatment demands certain sacrifices both as to order of presentation and perspective.

While the development of the first theme becomes in the latter part of the book merely a sort of incomplete Who's Who among workers in the field of physiological chemistry, and will probably be of limited interest, the book as a whole should find a large circle of friends in all the various fields of both biology and of chemistry. One cannot help feeling that it has been written by one who possesses not only a broad view of the field and vision of its possibilities, but also a comprehensive and firm grasp of the work done in this country.

The stimulating character of the volume is brought out by the fact that while its function is not primarily to suggest problems, many will find that interesting unsolved problems seem naturally to come to mind while one is reading—not merely one here and there, but many. It is a picture done in bold strokes but the outlines of which are firm.

There is a good "Author Index," but one must depend on the "Contents" for subject matter. The printing and make-up are excellent. ALLEN E. STEARN

Handwörterbuch der psychischen Hygiene und der psychiatrischen Fürsorge—By O. Bumke, München, G. Kolb, Erlangen, H. Roemer, Illenau, E. Kaln, New Haven. (Berlin and Leipzig: Walter de Gruyter & Co.) vi, + 400 pp. 1931. Price, bound, M. 25.

The widening interest in the field of mental hygiene and the diversity and

social divergences of the professional groups and social and governmental agencies concerned with this remedial process distinctly call for a comprehensive work dealing with this subject. It is to be found in this monographic dictionary in which are assembled the facts and theories of psychiatry and of psychology as applied to the mentally aberrant.

The rubrics are relatively few, in fact only 72 in all. They range from alcohol to world philosophy, and include such topics as industrial hygiene, psychical hygiene, marriage, eugenics, nutrition, epilepsy, encephalitis, institutional equipment and care, and organization of institutions of various types and purposes, juvenile psychopathy, social life, sexual life, delinquency, constitution, Kultur, the occult, spiritism, opium laws, suicide, and suggestion.

C. A. KOFORD

Growth and Development of the Young Child—By Winifred Rand, R.N., Mary E. Sweeny, M.S., and E. Lee Vincent, Ph.D. Philadelphia: Saunders, 1930. 394 pp. Price, \$2.75.

Our modern knowledge of early childhood has been considerably enriched in recent years. This has been due largely to coöperative research carried on in connection with nursery schools or child welfare institutes. A pioneer in this field is the Merrill-Palmer School of Detroit. Out of the fertile experience of this school has emerged recently one of the most comprehensive and well balanced books on growth and development of the young child it has been our pleasure to read.

This book is unique in beginning with an exposition of the philosophy of family life which is fundamental to an understanding of the child in its modern relationships. "The Family and the Home as Backgrounds for the Growth of the Child" gives us, in the second

chapter, a basis for both the hereditary and environmental considerations which follow. There is presented a well proportioned picture of the child in its family relationships with critical evaluation of the conflicting elements in modern home life.

Throughout the book the physical growth and development of the child are so interwoven with its emotional and personality development that we feel from beginning to end it is the whole child in its multiform relationships with

whom we are most deeply concerned. The book bespeaks that intimacy and understanding of child life which only those who have been in sympathetic daily touch with the child could really picture.

The subject matter is arranged in such a way as to give a sense of proportion to the whole. Helpful references are found at the end of each chapter and a selected bibliography of 165 titles adds to the value of the volume.

R. A. BOLT

BOOKS RECEIVED

- MARGARINE AS A BUTTER SUBSTITUTE. By Katharine Snodgrass. Stanford University Press, 1930. 333 pp. Price, \$3.00.
- PSYCHOLOGY FOR NURSES. By Fred A. Moss. Boston: Houghton Mifflin, 1931. 289 pp. Price, \$2.50.
- PROCEEDINGS OF EIGHTH ANNUAL SHORT SCHOOL TEXAS ASSOCIATION OF SANITARIANS. Assembled at Amarillo, Texas, August 26-28, 1930. Texas Association of Sanitarians, Austin, 1930. 95 pp. Price, \$1.00.
- INTRODUCTION TO PRACTICAL BACTERIOLOGY. 3d ed. By T. J. Mackie and J. E. McCartney. New York: Wood, 1931. 421 pp. Price, \$3.50.
- DETERMINATION OF THE INTERRELATIONS, PARTIAL AND MULTIPLE, BETWEEN VARIOUS ANTHROPOMETRIC MEASUREMENTS OF COLLEGE WOMEN. By Mary Louise Boillin. New York: Teachers College, 1930. 63 pp. Price, \$1.50.
- MODERN METHODS OF TREATMENT. 4th ed. By Logan Clendening. St. Louis: Mosby, 1931. 819 pp. Price, \$10.00.
- LATERAL CURVATURE OF THE SPINE AND ROUND SHOULDERS. 5th ed. By Frank E. Ober and A. H. Brewster. Philadelphia: Blakiston, 1931. 240 pp. Price, \$3.50.
- PROCEEDINGS OF THE NATIONAL CONFERENCE OF SOCIAL WORK. Fifty-Seventh Annual Session, Boston, Mass., June 8-14, 1930. Chicago: University of Chicago Press, 1931. 710 pp. Price, \$3.00.
- THE PSYCHOLOGY OF SEX: AN INTRODUCTION. By Erwin Wexberg. New York: Farrar & Rinehart, 1931. 215 pp. Price, \$2.50.
- LOVE IN THE MACHINE AGE. By Floyd Dell. New York: Farrar & Rinehart, 1930. 428 pp. Price, \$3.50.
- SO YOUTH MAY KNOW. By Roy E. Dickerson. New York: Association Press, 1930. 255 pp. Price, \$2.00.
- THE HOME CARE OF THE INFANT AND CHILD. By Frederick F. Tisdall. New York: Morrow, 1931. 292 pp. Price, \$3.00.
- CANCER AND SCIENTIFIC RESEARCH. By Barbara Holmes. New York: Macmillan, 1931. 160 pp. Price, \$1.50.
- FIRST AID FOR BOYS. Manual for Boy Scouts and Others Interested in Prompt Help for the Injured. By Norman B. Cole and Clayton H. Ernst. Revised Edition. New York: Appleton, 1931. 196 pp. Price, \$1.50.
- AIDS TO BACTERIOLOGY. 5th ed. By William Partridge. New York: Wood, 1931. 311 pp. Price, \$1.75.
- WHOLESOME LIVING SERIES. By Jesse Feiring Williams and Theresa Dansdill. Health and Happiness, \$.64; Health and the Rules of the Game, \$.64; Health and Control, \$.68; Health and Service, \$.72. By Jesse Feiring Williams, Health and Ideals, \$.80. Boston: Sanborn, 1930 and 1931.
- DI-HYDRANOL. Philadelphia: Sharp & Dohne, 1931. 8 pp. Free.
- THE MEASUREMENT OF NERVOUS HABITS IN NORMAL CHILDREN. By Willard C. Olson. Minneapolis: University of Minnesota Press, 1929. 97 pp. Price, \$2.00.
- WHAT WE DRINK. Edited by H. Wansey Bayly. London: Heineman, 1930. 128 pp. Price, \$.40.
- CANCER. Willy Meyer. New York: Hoeber, 1931. 427 pp. Price, \$7.50.
- WILLIAM HENRY WELCH AT EIGHTY. Edited by Victor O. Freeburg. New York: Milbank Memorial Fund, 1930. 230 pp.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

The Bellevue-Yorkville Health Demonstration, New York, N. Y.—The report of the Bellevue-Yorkville Health Demonstration for 1929 states that gross expenditures amounted to \$155,911.87, of which \$148,043.51 was contributed by the Milbank Memorial Fund. In accordance with plans initiated at the start of the demonstration for the peak of expenditures to be reached in 1929, a budget of \$150,000 was prepared for 1930, as compared with \$172,500 for 1929, adopted by the Board of Managers and approved by the Board of Directors of the Milbank Memorial Fund. This budget provides for assistance to the Health Department in the way of salaries for additional medical, nursing and clerical staff, and for special consultants in nutrition, mental hygiene, recreation, and social service to act as advisers to the nurses and in clinics.

At the beginning of the year the medical services carried on in the Bellevue-Yorkville Health Center consisted of a baby health station, a preschool clinic, an evening clinic for venereal diseases, the Yorkville chest clinic and a tuberculosis diagnostic service. In addition, three other baby health stations were maintained, at which there were 873 new registrations during the year. The number of children receiving three injections of toxin-antitoxin at the baby stations was 2,719. The children's clinic which had been conducted by the Association for Improving the Condition of the Poor was taken over on November 27 by the Health Department as an extension of its pediatrics service at the Health Center.

In January, 1929, a consultation service was opened for private physicians of the city, to aid them in making a diagnosis of patients suspected of having tu-

berculosis. Only patients sent by their physicians are examined at these three weekly sessions. No advice or information is given the patient, but a full report is made to the physician.

The number of nurses in the combined Bellevue and Yorkville Districts, who also serve territory out of the Bellevue-Yorkville area, averages 37. In the Yorkville District, the generalized system of nursing was introduced in 1929; in the Bellevue District, nursing organization is based on the specialized plan, each nurse being assigned to work either in school hygiene or in preventable disease work.

The statistician of the New York Tuberculosis and Health Association acts as consultant to the demonstration. Monthly reports are prepared on the volume of public health work in the area. The special undertakings of the statistical staff during 1929 include tabulation of the physical defects among school children examined, a brief analysis of new registrations during 1928, a study of the nurses' reports by principal lines of services to show time distribution, the case load, and a study of the number of household contacts to the tuberculosis cases under the care of the Yorkville clinic.

General health education and publicity in the demonstration area for 1929 included the distribution of over half a million pieces of printed matter, including 12,000 posters, to residents, doctors, dentists, schools, stores, clubs, health agencies, the publication of six issues of *Health News*, a picture newspaper, and the coöperation in the city-wide campaign for immunization against diphtheria. Three times as many children received the three toxin-antitoxin inoculations in 1929 as in 1928 at the baby health stations. The campaign in the

interest of periodic health examinations was also continued, in coöperation with the County Medical Society and the independent medical societies located in the district. As a result of 30,000 cards being distributed to school children, urging a yearly health examination, the health center was deluged with children asking for examinations. An emergency service was established to take care of those who had no physician, and who came accompanied by their parents, and 1,171 children were examined at a cost of \$.35 per child.

Health education in the schools has been developed by the organization of close relationships among principal, doctor, nurse and teachers, the immediate responsibility within the schools being that of the assistant principal. New developments have been regular conferences with the special teachers of health education, assistance with the teacher-training courses for grade teachers, development of a junior high school program, and the beginning of a more definite study of behavior problems.

The recreation problems of Bellevue-Yorkville resolve themselves around the improvement of the conditions within the district, which include but a small amount of safe outdoor play space, and the inability of a large number of children to enjoy vigorous play. A district recreation conference held at the health center in the spring of 1929 recommended possible plans for use, and secured the opening of a summer playground. Emphasis was placed on day outings in order to compensate for the inadequacy of play space within the district. Most of these were to parks, and some were for education in connection with the safety-and-health campaign in summer playgrounds. An important part of the recreation work in 1929 was the directing of recreation classes in three Catholic schools of the district.

By an arrangement between the dem-

onstrator and the Henry Street Visiting Nurse Service, a consultant in mental hygiene was added to the staff at the health center in April, 1929, the activities being twofold—those with the nursing group as a whole, and those with the individual nurse working on a special problem. At the close of the year, about 125 active mental hygiene cases were being carried by the Henry Street nurses in the district, representing a wide variety of problems which varied from many cases of poor health habits to neuroses, psychoneuroses and a few definite psychoses.

Montclair, N. J.—The 1929 health audit of the town of Montclair, N. J., is the yearly report of the work carried on by the Department of Health. Montclair had an estimated population in 1929 of 40,264. The resident death rate was 9.4 per 1,000, and the resident infant mortality rate for 1929 was 43.5, for which considerable credit is due to the prenatal and postpartum activity carried on in connection with Mountain-side Hospital by the Nursing Service of the Red Cross. Tuberculosis showed a slight decrease over 1928.

Of 445 re-Schicked school children, 298, or 67 per cent, were found immune; 148 were reinoculated. Of the 678 school children Schick tested for the first time, 212, or 31 per cent, were found to have a natural immunity. In the preschool clinic, 560 children received the toxin-antitoxin inoculations. The chest clinic, opened in 1905 by the Montclair Tuberculosis Committee, and since 1912 conducted jointly by the committee and the Department of Health, has been taken over entirely by the latter. The total attendance during the year was 286, the total number of patients 109, of whom 54 were new. Seventy-six patients were taken to the sanatorium.

The department passed an ordinance in 1929 which will limit the sale and

slaughter of poultry only to those having first class sanitary establishments. To insure against the danger of undulant fever, a letter was sent to all of the producers and distributors of raw milk warning against the menace and advising agglutination testing of herds.

Pittsfield, Mass.—In the 1929 annual report, the health officer of Pittsfield records an infant mortality rate of 68.7 and a neonatal rate of 42.6 in this city of 51,000 estimated population. During the first 3 months of the year, an increase in influenza cases reached epidemic proportions, 81 cases occurring at that time. There were but 4 cases during the remainder of the year, the deaths for 1929 totalling 12. There was a slight increase in the number of cases of diphtheria and scarlet fever, but no case of smallpox was reported.

Tuberculosis cases (29) and deaths (18) reached the lowest figure that has been recorded since there has been adequate reporting. Twenty-three of the 29 cases were hospitalized. The average number of farms supplying milk to the city was 170; 199 dairies were inspected and 501 samples of milk collected. The number of cows under test in the city exceeded 85 per cent—thus Pittsfield is eligible to be classed as a modified tuberculosis-free area.

The spring round-up was held in June, and a visit was made by a health department nurse to the parents of each child expecting to enter school in the fall of 1930. Parents were advised to take their children to a physician to be examined for medical defects and to be vaccinated. The clinic at the health department was held to accommodate those families who were without a family physician or who could not afford to visit a private physician. May Day activities were confined to dental work. The dental hygienist examined 2,007 children, and 1,361 were found to have dental defects. The total number of

corrections accomplished by this one examination was 2,364.

The 1929 budget contained an appropriation for mosquito control, and a member of the Harvard School of Public Health took charge of this work with favorable results. The report concludes with an appraisal of the city's health activities, following in detail the *Appraisal Form for City Health Work* of the American Public Health Association.

Hawaii Dental Survey—A comprehensive survey of the dental problem in the Territory of Hawaii was made in 1930 under the auspices of the Department of Public Instruction of the Territory and the Strong Foundation. The report of 158 pages by Guy S. Millberry, D.D.S., F.A.P.H.A., is broad in scope and of special interest to public health administrators and to those engaged in dental hygiene work.

This report describes in detail a community dental hygiene program which is probably unsurpassed in the country, and makes recommendations for future development. Many photographs, charts and statistical tables are presented, together with survey forms which should prove useful in studying dental programs elsewhere.

The 12 chapters of the report review the development of dental hygiene work and deal with important problems of legislation, organization and personnel, policy and procedure, records, finance, objectives and accomplishments, the dental profession, the press, research, and advanced instruction.

A school of dental hygiene was organized in 1921, in conjunction with the normal school, and three classes were graduated. All but one of the graduates entered school service in the territory. In 1920, the Honolulu Dental Infirmary was organized, and this work was later moved to a convenient wing at Palama Settlement where 5 dental operators were employed. In 1922, the

division of dental hygiene was organized in the Department of Public Instruction. In 1929, 98.8 per cent of the children in the public schools received instruction in dental hygiene or care. The dental hygiene division is under the direct control of a supervisor who reports to the superintendent of the public school system. In Honolulu, this work in the schools is correlated with treatments in Palama Settlement. "The influence of the program has extended beyond the schools into all territorial institutions and many private ones, a further endorsement of its value. . . . The passing of the Act of 1922, creating the Division of Dental Hygiene under the jurisdiction of the Superintendent of Public Instruction, is one of the outstanding pieces of dental health legislation in the country."

Montreal, Que.—The 1929 report of the department of health opens with a table of contents and an organization chart which shows the bureaus, personnel and activities of the department. The chart also indicates that the department of health functions under an executive committee with an advisory board of health of 9 members consisting of the chairman of the executive committee and the director of health *ex-officio*, 3 members of the city council, 2 members each of the faculties of medicine of the University of Montreal and of McGill University.

On the basis of an estimated population of 762,000, the per capita expenditure for the section of hygiene under the department of health amounted to \$.57, while that for municipal assistance was \$1.68. Other expenditures of the department included pensions and annuities, and allocations of \$20,000 to universities. A birth rate of 26.79 and a death rate of 13.9 are recorded. The infant mortality rate was 132.3. Comparative data for 10 previous years are presented. Many interesting statistical

tables are accompanied with descriptive text.

The National Committee for Mental Hygiene in Canada organized in 1929 a section for the Province of Quebec. The executive committee and the department of health inaugurated a program in the schools of the Catholic School Commission of Montreal, which is later to be operated in the Protestant schools. Two psychiatrists and two nurses with psychology training were employed to work with and instruct the physicians and nurses of the department of health engaged in school medical inspection work. During the school year the work was carried on in 17 schools attended by 12,500 pupils.

An agreement became effective between the school commissions and the department of health to establish close cooperation in school medical inspection. During 1929, 3,221 children were given three antitoxin Ramon inoculations as a protection against diphtheria. A Schick test was given these children 4 months after the last injection, and if positive, a fourth injection was given. A total of 15,337 smallpox vaccinations were given by physicians in the divisions of child hygiene and communicable diseases.

By July, 1929, 37 municipal baby clinics were in operation, an increase of 20 over the previous year. These clinics are operated by the staff of medical inspection of schools. In school sub-districts where a baby clinic exists, the school nurse is in charge with an assistant nurse (not a graduate). The other clinics are intrusted to graduate nurses, each of whom is in charge of two clinics. Medical inspectors serve one or two clinics and each of 11 part-time physicians have a clinic. There were 37,496 consultations in clinics with 33,568 home visits. Besides these municipal clinics there are 34 independent baby clinics in the city, 18 under the management of the Federation d'Hy-

giene Infantile, and 16 under the Child Welfare Association. These latter clinics submit monthly reports to the department of health.

Brookline, Mass.—During 1929, 509 births were recorded, of which 398 occurred outside of town to residents. There were 525 deaths in this community of 47,100 population, but 157 of the decedents were non-residents. There were 5 cases with no deaths from diphtheria. During the 6 years previous to 1923 when immunization work was undertaken, there were 288 cases and 11 deaths from diphtheria. During the 6 subsequent years, there were 51 cases with no deaths from this disease. An infant mortality rate of 43.3 is recorded.

A health bulletin has been published quarterly and distributed by the Police

Department to every house in the town. The purpose of the bulletin is to promote education in health matters and to inform residents of the quality of milk sold by the various dealers.

A decision of the Boston Medical Milk Commission made it possible for certified milk to be sold as a pasteurized product as well as raw. Specifications for school milk were revised to provide additional safeguards, including a requirement that the producing animals be tested and certified as free from contagious abortion. The milk is processed by the spray vat system, and the jars are sterilized in an automatic thermostat-controlled machine and automatically filled and capped to avoid human contact with the milk. The average dairy score was 93.8 and the average bacteria count of this school milk was 11,272.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON. PH. D.

Public Health Service Activities—This inclusive and most readable account of the varied activities of the U. S. Public Health Service will give just the right information to any sanitarian who wants to tell others what the federal health authorities do.

ANON. The Work of the United States Public Health Service. Pub. Health Rep., 46, 6: 269 (Feb. 6), 1931.

Advances in Tuberculosis Research—Outlining the progress in tuberculosis prevention and prepared for general practitioners of medicine, the paper deserves study by sanitarians as well.

BALDWIN, E. R. A Review of the Progress of the Control of Tuberculosis and Advances in Its Pathology and Bacteriology. New York State J. Med., 31, 4: 195 (Feb. 15), 1931.

Health Institute Costs—Painfully frank is this priceless story of what it costs to conduct a first-class public health institute and what results may be expected therefrom. Food for thought alike for the ambitious and the unambitious administrator.

BIGELOW, G. H., and LOMBARD, H. L. The Eighth New England Health Institute. New Eng. J. Med., 204, 6: 248 (Feb. 5), 1931.

Hospital Care of Scarlet Fever—This British experience in the hospitalization of scarlet fever cases leads to the following rules of procedure: anti-toxin for all; cases to be treated in cubicles; clean cases discharged after 3 weeks; convalescent cases to be Dick tested and reactors kept in isolation, clean cases in a convalescent ward.

BURTON, A. H. G., and BALMAIN, A. R. The

Hospital Administration of Scarlet Fever. *Med. Off.*, 45, 6 (Feb. 7), 1931.

Industrial Illness Rates—Plenty of statistical findings in regard to morbidity in employed groups; many questions about who suffer from what will find an answer in these two installments of a paper supplementing the extensive series published in the *Public Health Reports*.

BRUNDAGE, D. K. The Incidence of Illness among Wage Earning Adults. *J. Indust. Hyg.*, 12, 10: 381 (Dec.), 1930.

Venereal Disease in Industry—Not only what gonorrhea and syphilis do to industrial workers, but what industry can and should do to the venereal diseases is logically set forth in this excellent paper.

EVERETT, R. H. An Overlooked Health Menace. *National Safety News*, 23, 2: 32 (Feb.), 1931.

Public Medical Service in England—A straightforward and apparently unprejudiced account of the scheme for medical service for the industrial population. How the service affects public health is touched upon.

HARRIS, R. W. National Health Insurance Medical Service in Great Britain. *Canad. Pub. Health J.*, 22, 2: 55 (Feb.), 1931.

Hunger Striking Children—Most children who present the problem of anorexia are of the linear type, fatigued and irritable. Diets high in fat are contraindicated for such children. A quart of fruit juices in place of milk, and a low residue, high vitamin content diet, combined with a regimen of rest, have proved successful.

LUCAS, W. P., and PRYOR, H. B. Factors Involved in Combating the "Hunger Strike" in Children. *Am. J. Dis. Child.*, 41, 2: 249 (Feb.), 1931.

Delinquent Venereal Cases—Health officials perplexed by the prob-

lem of delinquency in venereal disease clinic attendance will find much to console them in this British discussion of "defaulters" in the Glasgow clinic.

MACGREGOR, A. S. M. The Problem of the Defaulter in V. D. Treatment Schemes. *Med. Off.*, 45, 5: 49 (Jan. 31), 1931.

Student Health Problems—Two questions are answered: should definite health instruction be included in the curriculum? and what are the desirable relationships between health and physical education?

OBERTLUFTER, D. Two Problems in Health Education. *J. Health & Phys. Ed.*, 2, 2: 3 (Feb.), 1931.

Nutrition and Growth—A group of underweight children on a special dietary of milk, whole-grain cereals, vegetables and fruit (meat and eggs excluded, making a preponderance of base-forming elements) made better gains, as judged by several anthropometric measures, than did a control group on a representative American dietary.

ROSENBERG, L. C. Malnutrition in Children. *Am. J. Dis. Child.*, 41, 2: 303 (Feb.), 1931.

Preventing Colds at Cornell—Students unusually susceptible to colds were divided into a cold prevention class and a control group. A reduction of about 50 per cent in colds was accomplished. If you would like to know how and what the possibilities in cold prevention are, read the article.

SMILEY, D. F., and MAUGHAN, G. F. Cold Prevention Work at Cornell University. *Sci. Monthly*, Mar., 1931, p. 235.

Industrial Nursing—A series of brief articles on industrial nursing problems make up the bulk of this issue of the *Public Health Nurse*. They are too numerous and brief to be mentioned separately in this bibliography, but all are well worth study.

TUCKER, K., *et al.* Industrial Nursing. *Pub. Health Nurse*, 23, 2: 55 (Feb.), 1931.

NEWS FROM THE FIELD

EDWIN J. BANZHAF

DR. EDWIN J. BANZHAF died suddenly of heart disease on March 17.

After graduation from Lawrence College he continued his studies at Columbia University where he received a degree of Doctor of Philosophy. Shortly after leaving Columbia University he became a member of the staff of the bacteriological laboratories of the Department of Health of the City of New York. For a period of 27 years he has been in charge of the chemical side of the production of biological products. His first important work was on methods of improving the refining of diphtheria antitoxin. This was published in 1907.

The endeavor to devise methods better to refine and concentrate the various antiserums became his life work. These included diphtheria and tetanus antitoxin, antimeningococcic, antipneumococcic and antipoliomyelitis serums.

During the past three years he spent a great deal of time trying to eliminate the chill producing substances from antipneumococcic serum. His efforts met

with marked success. His duties were gradually widened until he assumed control not only of the refining and concentrating of the different serums but also of some of the preventive vaccines, such as diphtheria toxin-antitoxin and toxoid. In time he also undertook the supervision of the preparation of the biological products for the final distribution to the physicians. He became one of the Assistant Directors of the Laboratories, January 1, 1910.

As his experience increased, he became widely known as probably the one in America who knew most about the practical refining of antibodies. A number of the biological plants in this part of the country so appreciated his knowledge that they appointed him a consultant.

Dr. Banzhaf was a scientist of the first order. He was modest and retiring in his disposition but made many warm and lasting friendships. His death is a very great loss to the laboratory in which he worked and to the people of the country. Not only those who were his colleagues but all workers in his field will miss him greatly.

NEW MOTHER'S DAY

WOMEN'S clubs throughout the country will join in an appeal on Mother's Day, May 10, to obtain adequate maternity care for mothers in the United States. Details may be had from the Maternity Center Association, 576 Madison Avenue, New York, N. Y.

SWISS EXHIBITION FOR HYGIENE AND SPORT

THE first Swiss exhibition for Hygiene and Sport, the "Hyspa,"

will be held at Berne from July 24 to September 20. The Exposition buildings are now being erected on the spacious Viererfeld for the following groups: Climatology and Balneology; Home and Residence; Diet, Food and Beverages—A Model Dairy; Clothing and Styles; Care of the Human Body and Sport; Protection of Workers, Social Welfare and Insurance; Infectious Diseases; Hospitals and Nursing; Medical Research and Medicines; Hygiene of Youth and Welfare of Mothers; Hygiene in Traffic; Mankind, including

Anatomy and Physiology—the history of medicine and natural sciences, etc.; Statistics; Army Sanitary System; Industry and Trade.

NATIONAL TUBERCULOSIS ASSOCIATION ANNUAL MEETING

THE annual meeting of the National Tuberculosis Association will be held at Syracuse, N. Y., May 11 to 14.

In conjunction with this meeting the Executive Committee has proposed a "pilgrimage" to Saranac Lake, which is only about 200 miles distant, and would like to hear as soon as possible from members and friends who would be interested in this pilgrimage.

NEW ENGLAND HEALTH INSTITUTE

THE New England Health Institute will be held in the Eastland Hotel, Portland, Me., April 20 to 23, 1931. The program is arranged in 10 sections. The sections and the chairmen of each are as follows:

- | | No. of
Lectures |
|---|--------------------|
| I Public Health Administration—Dr. Charles F. Dalton, Secretary of Board of Health, Burlington, Vt. | 5 |
| II Preventable Diseases and Cancer—Dr. Howard A. Streeter, Health Officer, Manchester, N. H. | 7 |
| III Sanitation and Engineering—Prof. Ira V. Hiscock, Yale School of Medicine, New Haven, Conn. | 6 |
| IV Tuberculosis—Dr. Alton S. Pope, Director, Division of Tuberculosis, State House, Boston, Mass. | 6 |
| V Venereal Diseases—Dr. Charles A. Weaver, Director, Division of Venereal Disease Control, Concord, N. H. | 5 |
| VI Child Hygiene—Charles F. Wilinsky, M.D., Deputy | |

Health Commissioner in charge Child Hygiene and Health Units, Boston Health Department, Boston, Mass.

VII Mental Hygiene—Dr. Carl D. Bond, Pennsylvania Hospital, Institution for Mental Hygiene, Philadelphia, Pa.

VIII Health Education—Prof. C. E. Turner, Massachusetts Institute of Technology, Cambridge, Mass.

IX Vital Statistics—Dr. T. F. Murphy, Chief Statistician for Vital Statistics, Bureau of the Census, Washington, D. C.

X Public Health Nursing—Harriet Leck, R.N., Visiting Nurse Association, Hartford, Conn.

Dr. C. F. Kendall, Commissioner of Health, is director of the New England Health Institute and Dr. W. L. Holt of the Maine State Department of Health is chairman of the program committee. Preliminary announcements will be sent out early in March to all physicians, dentists, nurses and health workers. The program is nearly complete and will be mailed some weeks later to all members of the A. P. H. A. in New England and others interested.

Among the prominent speakers will be Dr. T. J. Parran, Dr. William J. French, Dr. C.-E. A. Winslow, Dr. S. D. Kramer, Dr. F. L. Hoffman, Frank Kiernan, Dr. Matthias Nicoll, Prof. C. E. Turner, Dr. R. B. Kerr, Dr. T. F. Murphy, and Dr. H. L. Lombard.

TEXAS SHORT SCHOOL
DATES for the Ninth Texas Sanitarians Short School have been designated for November 9-14, inclusive, at Houston, Tex. Those in charge

are: Dr. H. K. Read, President of the Texas Public Health Association; Dr. Allen C. Hutcheson, Director of the School; C. F. Browning, General Chairman; and E. G. Eggert, Secretary.

COLLEGE HYGIENE

THE National Conference on College Hygiene to be held at Syracuse University, Syracuse, N. Y., May 5 to 9, under the joint auspices of the Presidents' Committee of Fifty on College Hygiene, The American Student Health Association, and the National Health Council, aims to come to an agreement on desirable minimum standards for the teaching and practice of college hygiene. Dr. T. A. Storey of Stanford University is Chairman of the Conference and Dr. H. S. Diehl, Dr. Walter Brown, Dr. Joseph Raycroft and Dr. D. H. Smiley head the four sections on Health Service, Health Teaching, Physical Welfare Activities, and Miscellaneous Problems. Reduced rates on the certificate plan have been granted by the railroads.

MICHIGAN PUBLIC HEALTH ASSOCIATION

THE Tenth Annual Conference of the Michigan Public Health Association and the Michigan Department of Health was held in Lansing, January 7-9.

The officers elected for 1931 were as follows: Dr. C. C. Young, President; Dr. Merrill E. Champion, Vice President; Dr. W. J. V. Deacon, Secretary-Treasurer; Dr. C. C. Slemons, Representative on the Governing Council, A. P. H. A.

RESEARCH FELLOWSHIP OFFERED BY NATIONAL TUBERCULOSIS ASSOCIATION

THE National Tuberculosis Association announces a limited number of fellowships in social research as related to tuberculosis, open to graduate students who have had special training in statistics, social science, or public health.

Preference will be given to candidates who are interested in pursuing research in public health after the completion of this fellowship. Interested candidates should write to Jessamine S. Whitney, Statistician, National Tuberculosis Association, 450 Seventh Avenue, New York, N. Y., for further information.

NORTHERN CALIFORNIA PUBLIC HEALTH ASSOCIATION

THE annual meeting of the Northern California Public Health Association was held in the Women's City Club in San Francisco on February 7 with an attendance of over 100.

The following officers were elected: President, Guy S. Milberry; First Vice-President, Thomas A. Storey; Second Vice-President, Dr. W. H. Kellogg; Treasurer, Mary E. Davis; Secretary, Walter H. Brown.

NEW YORK SPECIAL HEALTH COMMISSION

NEW York State, through a Special Health Commission appointed by Governor Roosevelt, has recently issued a report the recommendations of which have been incorporated in a Bill now before the state legislature, leading to a new forward-looking program of public health administration.

Dr. Livingston Farrand, President of Cornell University, as Chairman of the Commission has issued a statement indicating that the major recommendation of the Commission is that a county board of health be organized in each county in the state in place of the present system of small township and village health units.

Other important recommendations of the Commission include the provision for additional state tuberculosis sanatoriums, an enlarged cancer program, more adequate facilities for the discovery and care of crippled children, increased authority over the sanitary control of public water supplies and stream

pollution, and provision in the program of county boards of health for the diagnosis and treatment of the venereal dis-

eases, more extensive health measures for mothers and children and better trained public health personnel.

PERSONALS

DR. GEORGE W. GALE, who is 94 years old, is planning to retire as a member of the Saugus (Mass.) Board of Health when his term expires after nearly 35 years' service.

COL. MATTHEW A. DELANEY, Army Medical Corps, Chief Medical Adviser to the Governor General of the Philippines, will on May 1 become Chief Surgeon, 5th Corps Area, Columbus, O.

VERANUS A. MOORE, M.D., D.V.M., D.Sc., Dean Emeritus of the New York State Veterinary College of Cornell University, died on February 11 as a result of cardiac weakness following a major operation. Dr. Moore has been a member of the American Public Health Association since 1896, and a Fellow since 1922.

DR. HAROLD RYPINS of New York was elected president of the Federation of State Medical Boards of the United States.

DR. WALTER W. LEE, formerly with the State Department of Health of Connecticut, was recently appointed District Health Officer in the Berkshire District of Massachusetts.

JOSEPH P. DAY was reelected president of the Judson Health Center, 237 Thompson Street, New York, N. Y.

LOUIS CARLETON BULKELEY of Shreveport, La., passed away on December 24, 1930. He was a Fellow of the American Public Health Association.

DR. R. E. HICKEY on February 1 became Director of the Bureau of Communicable Diseases, of the Department of Health, Milwaukee, Wis., filling the position vacated by Dr. M. R. French, now of the New York State Health Department.

J. ROSSLYN EARP, Dr.P.H., formerly Director, Department of Health, Antioch College, Yellow Springs, O., was recently appointed Director, Bureau of Public Health for the State of New Mexico. He succeeds George S. Luckett, M.D., who resigned several months ago.

WADE H. FROST, M.D., has been appointed Dean of the School of Hygiene and Public Health at Johns Hopkins University, succeeding W. H. Howell, Ph.D., M.D., who has been Director.

CONFERENCES

April 8-11, American Physiological Society, Montreal, Can.

April 8-11, American Society for Experimental Pathology, Montreal, Can.

April 8-11, American Society for Pharmacology and Experimental Therapeutics, Montreal, Can.

April 8-11, American Society of Biological Chemistry, Montreal, Can.

April 8-11, Federation of American Societies for Experimental Biology, Montreal, Can.

April 12-15, Tenth Annual Convention, International Society for Crippled Children, Cleveland, O.

April 13-16, American Red Cross, National Convention, Washington, D. C.

April 14-16, Tennessee State Medical Association, Knoxville, Tenn.

April 14-20, World Conference on Work for the Blind, New York, N. Y.

April 15-18, American Orthopedic Association, Memphis, Tenn.

American Journal of Public Health

and THE NATION'S HEALTH Vol. XIII No. 5

Volume XXI

May, 1931

Number 5

Public Health Service— A Sound Investment*

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PUBLIC health work in America has developed with little regard to its cost or its value as an investment. It has grown primarily out of a generous desire to care for widespread illness and to check the spread of the more spectacular infectious diseases. Every epidemic of yellow fever, smallpox, and cholera, strengthened the limited powers of the health authorities. The activities they inaugurated were common sense reactions to the pressing needs of a dangerous situation. Later, esthetic considerations played their part. The growth of our cities demanded the removal of rubbish and of other wastes and this soon became a recognized function of many health departments. It was only in comparatively recent years that such activities as public health education, child hygiene, nursing, infectious disease control, and the other functions which constitute the routine of our best departments today, were added one by one; but even where the work has been most extensively organized, there has been very little recognition of the economic advantages accruing from this type of service.

No wonder then that the public health program has been extended in a halting fashion and has nowhere reached its full potentialities. The claims of health officers have not always been particularly convincing. There has been considerable hesitation about spending public funds on plans which often seemed tentative and experimental in character. To justify the widening scope of health service, it is intended in this paper to consider whether it is not, among other things,

* Presented at a General Session of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

a sound business proposition. The time has now come when we can evaluate in monetary terms the claims of public health effort. Public health work can be justified very much as are other communal services such as the paving of our streets, the building of roads and the establishment of fire departments. These undertakings pay for themselves and bring a return more than sufficient to meet their cost. I propose to show that certain phases, at least, of the public health program are among the most profitable investments in which a community can place some of its funds. In fact, it is not difficult to prove that the financial returns are often out of all proportion to the cost of the effort, and justify much larger outlays than even the most progressive communities have made.

VALUES TO DEPENDENTS AND RELATIVES

Everyone will agree that human life has value, not only sentimental, but actual economic value. The view that men, women and children should be looked upon as community assets is rapidly spreading throughout the civilized world. Learned books have been written to show that human life in the aggregate is the community's greatest asset, far transcending material possessions of all kinds. There is, in the first place, good indication that human beings have economic value based on the fact that it costs a great deal of money to raise them to the point where they function as productive individuals. Parents ordinarily spend large sums of money to bring their children into the world, to feed, house, clothe, educate them, and to give them all the other things that are a necessary preparation for good citizenship. Having in mind that large group of people who constitute the average of our population, it costs about \$10,000 in actual cash to provide even the very modest requirements of a growing child up to the age of 18. There are, of course, large numbers of children on whom much more is spent; but, broadly, one can consider \$10,000 as a figure fairly representing the cost of bringing a child to maturity in the United States today.

Now it may be argued that money spent on an individual is no measure of his economic value, and perhaps a good case could be made out for that point of view. Parents spend money on their children not because they expect a good return on the investment, but because they love them and wish to serve them. After all, the best proof that human beings have economic value lies not so much in their cost but rather in their capacity to produce. We shall avoid debatable ground in attacking the question of the money value of human beings by considering them in their specific relationship to other individuals and on

this basis determine their value to their relatives. The commonest relationship is that of the breadwinner to a dependent wife and child. The average wage earner has very obvious money value to such dependents, and it is ordinarily a relatively simple problem to calculate the value of this wage earner to his dependents. It will depend upon the man's annual earnings and his age, for his age determines his probable after life-time.

Dr. Lotka and I, in our recent volume, *The Money Value of a Man*, have produced a series of tables which give the money value for persons of various earning capacities at different ages of life. For example, the money value to his family of a man 30 years old in the \$2,500 income class is \$31,000; for one in the \$5,000 income class, it is nearer \$50,000. In other words, it would take that much money put at interest at 3½ per cent to produce for a body of persons at a stated age, the total net income which they would earn for the rest of their natural lives. For those belonging to the higher income classes, the economic values to dependents are very much greater.

Such economic value of human beings to their dependents is well understood and is universally granted by the laws and our courts. Whenever an injury is done to an individual through the fault of another, he or his dependents can collect damages which bear some relation to his economic value. More and more, the courts are inclined to take into consideration authentic figures of economic value and make them the basis of awards, rather than leave the adjudication to sentiment or to the effect of eloquent pleas to juries. The main point here is that human beings, men, women, and children, have economic value as individuals—and in the aggregate such value transcends all other values. There is no greater asset in any community than the human beings who make it up. When some of them are destroyed or put out of action, the community thereby loses some of its wealth. When they are preserved and brought up to maturity with the least amount of wastage, the community profits and becomes enriched through the added productiveness of its citizens.

LEGAL ASPECTS

An interesting and instructive application of this principle that human life has money value is found in the legal cases now rapidly accumulating in which damages have been awarded against private companies and cities which have supplied drinking water that was polluted and hence responsible for typhoid fever cases and deaths. It is now a settled principle of law in the United States, confirmed by the Appellate Court in a case against the City of Albany, that a private com-

pany or a city acting as a corporate body which supplies water for human consumption must exercise every reasonable precaution to render it safe. If it is negligent in this obligation and injury results to a consumer, it may be sued for damages.

The first legal case on record, apparently, followed an epidemic of typhoid fever in Ashland, Wis., in 1893-1894 which was directly traced to an infected water supply. The widow of one of the victims brought suit against the water company and was awarded \$5,000 damages. Even more famous in establishing this principle of law was the case of *Keever vs. the City of Mankato, Minn.*, in which damages to the amount of \$5,000 were awarded in 1910 against the city because of a typhoid fever death resulting from the pollution of the water supply. A number of similar cases have occurred since then; but on the whole these important precedents have received much less attention than they deserve from health officers.

In 1920, following a typhoid epidemic in Pittsburgh, Calif., the Supreme Court of that state awarded nearly \$33,000 in damages to 19 plaintiffs who had suffered from the disease. The largest penalties on record are those against the City of Olean, N. Y., which two years ago suffered from an epidemic of typhoid fever in which 212 cases and 18 deaths occurred. It was necessary to vote a bond issue of \$350,000 in order to pay the claims; and in 1930, this same city requested permission of the state legislature to issue bonds for an additional \$75,000 in order to cover its losses.

It is true that these cases all center around the responsibility of the community to protect citizens from typhoid fever. To what extent is this principle of responsibility applicable to other situations in which the municipality has taken over the control of community needs? It is a fact recognized by everyone that in the complex life of our cities, the individual is quite unable to protect himself and his children against infection from a host of diseases and conditions. This is the justification and warrant for the health department. Consequently, the individual looks to the organization of his city or county to protect him. In so far as such obligations are assumed by the organized agencies of government, the question may well be asked whether injury resulting from neglect of such responsibility may not justify damages in the form of compensation to the injured parties. While there have been no such cases, and while there may be legal considerations which rule out such claims, it would seem that this possibility should be carefully considered. Once the principle of financial responsibility is widely established, public health work will be placed on a more permanent and secure basis than it has hitherto enjoyed.

PROGRESS IN HEALTH CONSERVATION

I raise these questions because they illustrate in dramatic form the thesis which I am elaborating, namely, that human life has great economic value and that public health work, as it has developed, has long been and is now becoming to an ever greater degree a conserver of such values. But long before the thesis that public health work may be regarded as a public investment was elaborated and before cases of damages occurred, proof had accumulated that the neglect of the public health was poor economy. The history of sanitary effort, as it has developed during the last 50 years, is replete with achievement. Though everyone is more or less familiar with the progress of the health conservation movement, it may be desirable to rehearse some of the principal public health activities which have resulted in a widespread reduction of sickness and of premature death.

First of all, typhoid fever has been almost completely controlled in the United States. It is but a short time ago that epidemics of this disease ravaged the countryside and took a heavy toll even in our large cities. As late as 1900, the death rate from this cause was 36 per 100,000 of population in the U. S. Registration Area, and it was unquestionably very much higher in the rural non-registration states. Each death represented at least 10 cases. Many readers are old enough to recall the epidemics of typhoid fever in Cincinnati, Philadelphia, and Pittsburgh, and any number of other communities, in which thousands of cases and hundreds of deaths occurred because the water supply was polluted and little or nothing was done to prevent the spread of the disease through secondary infection. It was perfectly clear that such conditions could not long continue if the cities were to grow and prosper as residential and business centers. Finally excellent water systems were installed in the larger cities and as a result of better supervision, and chlorination of water when necessary, the typhoid fever rate dropped in an amazing manner.

The death rate was only 5.5 per 100,000 in 1927; for the urban part of the population, it was only 3.0. In some communities like New York, where hundreds of millions of dollars were spent on the water system, barely a case of typhoid fever or a death which could be traced to the city's water supply has occurred in years. Because of its wise sanitary precautions the city, like so many others, has been enabled to grow to an extent consistent with its economic possibilities. Altogether, the experience has been so favorable that there is little danger at this time that any large community in the country will be tempted to skimp on the expenditure necessary to supply its citizens with plenty of good water. It does not require damage suits to prove

that this kind of public health work pays for itself and handsomely.

Other conditions have been attacked by the health authorities with similar success. The control of malaria is an excellent illustration of the large financial returns which have resulted from well conducted public health effort. This disease was until recently widespread over the southern states. It lay like a heavy weight on the country, sapping the energy of large populations and in certain areas rendering them virtually nonproductive. Then came the new technic for the study and eradication of the disease. This was launched largely under the direction of the public health movement and demonstrated not only that malaria could be controlled but that it cost a sum so small as to be out of all proportion to the value of the lives thus protected. Results of malaria campaigns are quickly discernible. In a number of demonstrations, the morbidity rates from malaria have been reduced to a third in the short period of two or three years.

The effort of the International Health Board of the Rockefeller Foundation in this field has been extremely significant. According to its reports, the usual methods of drainage, screening, and treatment of infected cases, may be carried out at a per capita cost of from \$.45 to \$1.00 a year. This amount is, of course, only a fraction of what is gained through the reduction of cases and the prevention of deaths. In fact, it is not too much to say that the campaign against malaria has resulted in a complete change in the economic and social life of large areas in our southern states. Many of the new industrial efforts, so characteristic of the new South, are entirely predicated on the elimination of malaria, as well as of typhoid fever and hookworm; the 3 scourges which have so heavily afflicted this part of the country.

Successful results have, likewise, attended the campaigns of health departments during the past 25 years to reduce infant mortality. By means of popular education and the service rendered in baby health stations, the mortality of infants has been reduced to less than half of what it used to be; so that now the infant mortality rate is under 7 per cent. There has been no greater contribution to the welfare of the community than the saving of this number of potentially valuable human lives; nor has this effort of the public health movement been limited to the first year of life. The same services have led to marked reductions in the mortality and morbidity of children in the preschool years from diarrhea and enteritis and other infections. The whole campaign of child welfare has been built around an attempt to safeguard the infant and to stimulate the growth of children into healthy and productive citizens. The child health campaign will on careful analysis be found to have paid for itself many times over.

A claim equally far-reaching can be made for the campaign to control tuberculosis. I need not recount all the efforts which have gone into this movement. The work has not been done by health officers alone; but it is to the everlasting credit of a few far-sighted public health authorities that the entire program was organized and other groups in the community were encouraged to aid the movement. Altogether, an amazing success has been achieved. In the short period of 30 years, the death rate from tuberculosis has been reduced to about one-third of what it was, and at present the rate of decline is faster than ever. The gains to the country economically and socially are incredibly large. Tuberculosis used to be one of the chief causes of poverty. Social workers were in the habit of tracing the origin of many of their relief cases to its ravages. Today, relatively few such cases come to their attention—other conditions now cause the trouble.

The more recent efforts of health departments also have important economic aspects. Less than a decade ago, they initiated a campaign to eradicate diphtheria, the intensive development of which goes back only three or four years. Already this disease is being erased from the list of community health problems. Active campaigns of immunization have been strikingly successful. In some cities, the current figures show a reduction of 50 per cent and more during the last year or two. The death rate which in 1910 was 21.4 per 100,000 of population in the registration area will this year probably be close to 5.0. Apparently, the complete elimination of diphtheria is only a matter of a few more years. All that is required is the effective routine of educating parents to immunize every young child.

I could refer to the promising efforts to reduce pneumonia, to the newer work against certain forms of heart disease, and the venereal diseases, all of which show real achievement and point to even greater success in the future. Possibly, however, the largest gains will come from the efforts of health departments to inculcate a new conception of personal health among the great mass of the people and to teach the lesson of preventing disease by keeping physically fit.

Whether the work is directed to the control of infection or takes the form of education, the result is pretty much the same. Life is being guarded from disease and premature death and life is being conserved on an enormous scale. We need only look back to the condition of 30 years ago when the death rate of the country was 17.6 per 1,000 annually. It was only 12.0 in 1928 and will be appreciably lower this year. This represents an immense annual saving of lives.

Possibly one may best appreciate the significance of this change by noting the extension in the average duration of life during the interval.

In 1901, the mean length of life at birth was 47 years for males and 50 for females. In 1927, the corresponding figures were 57.9 and 61.0, a gain of about 10 years for each sex. These gains are fortunately not mere additions to the period of useless old age, but rather represent years of activity and production achieved through eliminating much premature death.

ADVANTAGES TO THE COUNTRY

It is obvious that, human life being worth what it is, its saving on an immense scale has increased the wealth of the country. For example, the gain in expectation of 10 years during the interval since the beginning of the century means an increase in the money value of a man of well over \$1,000. Under the conditions prevailing in 1901, a person of age 20 in the economic class in which the maximum annual earnings were \$2,500 would have a money value to his dependents of \$28,800. At the present time (that is, under current mortality conditions) a person at the same age would be worth \$30,200. In other words, there is a gain of \$1,400 in the value of an individual because of his longer productive lifetime. A similar gain is credited to each year of age up to age 30, and even at age 40 the greater life expectation means a gain of \$550 an individual. In other words, when we prevent disease and postpone death, we are adding large and very tangible money values to the wealth of the community. Enormous gains to individual families and consequently to the nation result when public health activities function fully and effectively. There is every reason to believe that these gains have played a very large part in bringing about a higher standard of life and a more diffused prosperity to the people of the United States. Those who live longer, less harassed by preventable disease, can work more, produce more, pay larger taxes, and play an altogether more valuable part in the life of the nation.

I do not for a moment assume that all the lives saved and all of the cases of disease prevented have been due to public health activities. Other factors have undoubtedly played their part; but no one would deny that it is to the organized health agencies of the country, whether under public or private auspices, that we owe our greatest debt. It is particularly interesting that these health agencies have performed their services at a cost so small as to be almost negligible. It has always amazed me to see how minimal the figures are which have produced results so important to the national economy.

According to recent studies in a group of 183 cities, the average expenditures for public health work were highest in the largest cities. In those with 100,000 and more, the average health department ap-

propriation, exclusive of hospital care, was about \$.62 per capita. In the cities between 30,000 and 100,000, the appropriation was \$.525, and in those between 10,000 and 30,000, only \$.47 per capita. These figures do not include the expenditures of the voluntary agencies.

In another group of 108 cities which were enrolled in the Health Conservation Contest launched by the Chamber of Commerce of the United States last year the per capita figures were somewhat higher. The average expenditure of the health departments in these cities was \$1.03. In the 10 cities of over 500,000 population, the average was \$1.15; in the 6 between 250,000 and 500,000, the average was \$1.34. The highest expenditure was in the 16 cities between 100,000 and 250,000, with an average of \$1.76 per capita. The cost of health service in the smaller cities varied from \$1.03 to \$1.22. These figures include the expenditures of the official health department, any health work of the board of education, and that of all voluntary health agencies, but do not include the cost of hospital care in any form.

Even the cities which carried off the highest awards in the contest showed extremely moderate expenditures. Thus, Milwaukee reported only \$1.31 per capita last year, including the cost of public health service by private agencies; Syracuse, N. Y., a total of \$3.05 for all expenditures; East Orange, N. J., \$1.22; White Plains, N. Y., \$2.75; and Sidney, O., \$1.21. The average cost of all types of public health service in this group of 5 leading cities was only \$1.75. In other words, about \$1.50 represents the outlay in cities that have taken their health work seriously and are achieving worthwhile results. It is clear that by and large, the municipalities of the country are running well below this figure.

The costs in our rural areas are considerably lower than in our cities. Counties whose health work has attracted attention are spending little more than \$1 per capita per annum and the general run is much less. Taken all in all, if we include all types of public health service, official and private, local as well as state and federal, the annual figure will be considerably under \$1 per capita for the people of the United States; but even if we should assume an average of \$1 per capita in order to play absolutely safe, the total for public health work would reach only a little over 120 million dollars per year for the entire country.

This sum is small indeed when we consider the number of lives at stake and their enormous money value. Obviously there is a great disproportion between the two accounts which we are balancing, namely, of outlay and of savings. That is why it is suggested that public health activities, when well conducted, are among the most de-

sirable and profitable of public investments. In many respects, these efforts are only beginning. The pitifully small amounts expended for health service in so many cities and in the rural areas of the country show how backward we are in making available to all people the benefits of present knowledge. Practice and application lag far behind what we now know very well how to do. While it is true that the general death rate has been reduced to a very low point, there are still close to 100,000 deaths a year from tuberculosis. I am confident that three-quarters of these could be postponed for shorter or longer periods. There are large areas in the country where little or nothing has as yet been done to cope with the tuberculosis problem.

When our present knowledge regarding the care of certain types of pneumonia is put into operation on a large scale, we should succeed in reducing the number of deaths from this disease by one-third to one-half. Pediatricians agree that deaths from diphtheria can be virtually eliminated and those from diarrhea reduced to one-quarter of the present number. All but 5 per cent of the remaining typhoid cases can be prevented. Safety engineers are very confident of their ability to reduce by a quarter the number of accidents in industry, in our homes, and on our highways.

The great problem still remains how best to prevent and treat the ailments of middle life, namely, heart disease, Bright's disease and cerebral hemorrhage; but even here progress is being made. Information as to the causes leading to these degenerative conditions is increasing. It is not too much to expect that a perceptible proportion of deaths can be postponed for a time at least.

For these reasons, I estimate that the expectation of life can be increased by more than 5 years provided the knowledge now available be utilized by health organizations, public and private. The expectation of life in the country as a whole can be extended to a span of at least 65 years. This is not an idle dream for it has virtually been done in far-away New Zealand. Progress will go considerably beyond this point; exactly how far, will depend upon new discoveries in preventive medicine in our laboratories and clinics.

The vital question is whether the American people are really in earnest about expanding the public health program and in proving its effectiveness. It will be necessary, of course, to strengthen the facilities of health departments, to build up more efficient organizations, train health workers better, make their tenure of office safer, pay them more adequate salaries, and develop a more professional spirit among them. This will necessitate larger expenditures. But so small is the amount spent at present that there should be no difficulty in

obtaining increased funds in a country as rich as the United States.

Our best authority, Professor Winslow of the Yale School of Public Health, has estimated that an expenditure of only \$2.50 per capita for health service will provide all of the activities of a well rounded program. Other authorities and experience attest to the soundness of this estimate. Health appropriations should, however, remain flexible. Where there are special difficulties to overcome, as in malarial regions or where special racial groups present health problems requiring additional services, the per capita figure should be higher; but taken by and large, an expenditure of \$2.50 per capita for the country as a whole, including the rural areas, will be found adequate. This moderate sum will provide all the facilities that can profitably be used at present. As additional knowledge becomes available and health departments can safely extend their operations into new fields, the amounts may be somewhat increased. At any rate, the figure given is sufficient to maintain the best current practice. A total expenditure of 30 million dollars for the public health service of the entire nation, or about 180 million dollars more than is now being spent, is all that is necessary.

I need not stress the insignificance of the amounts now expended for public health service. As a nation, we have learned how to spend money freely for things inconsequential as compared with public health. We are notorious for our large outlays for luxuries of every character. Our annual candy bill has been estimated as high as 690 million dollars; perfumes and cosmetics consume another half billion, and our tobacco bill is rapidly approaching the 2 billion dollar mark, if it has not already passed this point. In a country like ours, there should be no great difficulty in making available soon the small sum which if put into the hands of our health authorities would give them the power to reduce sickness and prevent death as far as our present knowledge permits.

I am very optimistic over the prospect of achieving this ideal. The business men of the country are already waking up to the fact that it is to their interest to further the public health campaigns. They realize that a good health record is a business asset for a city and they advertise this widely in their effort to attract industries, conventions, and the travelling public. Possibly, no more significant event has taken place in recent public health history than the entry of the Chamber of Commerce of the United States into a close alliance with the American Public Health Association. The launching of the City Health Conservation Contests is really an accomplishment of the first importance.

Already in 200 cities, local chambers of commerce are interested and are coöperating actively with their local health officers and the public to make possible improvements of all kinds in the health service. This active interest of the business men should make a profound difference in the amounts appropriated for local health service. I hope it will not be long before 500, yes even 1,000 cities, will enter the contest and make the good natured rivalry among them a national institution. There is no better way to direct the attention of the public to the importance of their health service. When this has been achieved, it will not be necessary to prove that expenditures for public health service are a sound investment. The results will be evident to all who wish to see.

Physicians per Capita

ACCORDING to a report prepared under the direction of Dr. Willard C. Rappleye, the United States has 1 physician to every 800 persons, a larger number in proportion than any other representative country in the world. Other countries come as follows: Switzerland, 1,250; Denmark, 1,430; England and Wales, 1,490; Germany, 1,560; France, 1,690; The Netherlands, 1,820; and Sweden, 2,860.

There is tremendous pressure by would-be students on all medical schools for admission, which would indicate that more facilities for medical students are needed, but the real basis for such a decision should be judged by the need of the country for physicians and the extent to which facilities at present meet that need.

There are 66 approved 4-year medical schools in this country which graduated about the same number of physicians in 1930 as the 131 schools then existing did in 1910.

Perhaps the most heartening finding is the fact that each year shows a larger number of applicants who have completed more than the minimal requirements for admission than the medical schools can accommodate. The most recent figures show that 50 per cent of the students applying for admission to medical schools have completed a full college course. Many take combined academic and medical courses which give them the bachelor's degree at the end of the first or second year of medicine. Of those graduating in 1930, 70 per cent had the bachelor's degree, compared with 24 per cent in 1920, and 15 per cent in 1910.—*United States Daily*, Mar. 16, 1931.

Differentiation of the Species of the Genus *Brucella**

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THE differentiation of the known species or varieties of *Brucella* and the mechanism of their behavior which serves to separate one from the other continue to be one of the important problems occupying the minds of those who are engaged in studying this group of microparasites and the reactions which they elicit from the host. It is now known that there are three species in the genus: *Brucella melitensis* (Bruce), *Brucella abortus* (Bang), and *Brucella suis* (Traum). The accumulating data indicate that they invade and produce disturbances in the tissues of as many species of animals as any other known pathogenic microbe. The desirability of being able to identify them with certainty is therefore obvious.

It is imperative that a satisfactory method or methods be available to determine if a strain coming from one species of host is entirely different from a strain coming from another. It is also important to know whether each of the species of *Brucella* is confined to one particular host or may have several hosts. This is especially important from the standpoint of human infections if their source is to be established more definitely. At present it appears to be established that one species of *Brucella* is common to the goat, one to the cow, and one to the hog, but this does not imply that each is confined always to a single host. It may occasionally be found in a variety of hosts. In the past, a strain recovered from the goat was called *melitensis*, if from the cow it was called *abortus*, if from the hog it was also called *abortus*. Yet, those from the hog were isolated under aerobic conditions and considered more pathogenic for guinea pigs than the strain common to cattle.

The fact that a given strain comes from a cow, a hog or a goat is not conclusive proof that it is *abortus*, *suis* or *melitensis*. Not until hundreds of strains from different animals in different countries have

* Read before the Laboratory Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

been studied with respect to their individual peculiarities, if such exist, will the relationship of *Brucella* to different hosts be known.

During recent years there have been no less than 10 methods proposed for the differentiation of the species of *Brucella*. Most of these have dealt with only 2 of the species, *Br. abortus* (Bang), and *Br. melitensis* (Bruce). Most of these have been thoroughly discussed before. Recently, 2 more methods of distinguishing *abortus* from *melitensis* have been proposed. One, by Favilli,¹ is based on the difference in the viability of the two on a semi-solid culture medium, and the other, by Valenti,² on the bactericidal action of homologous serums coming from individuals who have recovered from undulant fever.

The first would appear to possess too great a degree of uncertainty; yet, cultures identified by Favilli in this manner and later sent to the writer for confirmation by other methods were found to be in agreement. The second, that of Valenti, appears to be valueless. We have not been successful in our efforts to confirm his findings. As a matter of fact, we have labored for 2 years to obtain a serum possessing bactericidal properties for *Brucella* and our efforts have been negative.

The McAlpine and Slanetz' method, based on differences in the glucose metabolism of *Brucella*, is satisfactory for identifying *Br. abortus*, but it does not with a certainty distinguish *Br. melitensis* from *Br. suis*.

The differential method which has received the greatest amount of attention is that of agglutinin adsorption. This is uniformly valuable in distinguishing *Br. melitensis* from *Br. abortus*, but the usual technic employed does not distinguish *Br. suis* from *Br. abortus*. Henry³ states that if R strains of *Br. suis* are used as antigen, this species may be distinguished from *Br. abortus*.

The value of any method for distinguishing closely related species of microorganisms lies in the ease and accuracy with which it can be employed and the consistency of results, even after the organism has undergone physical changes such as from an anaerobic to an aerobic state and variations in agglutinability. When more than one species occurs in infective material, such as blood or feces from cases of undulant fever, and milk or aborted fetuses from infected cattle, the differential method should tell us this fact, and further should separate one from the other. It should also find useful application in keeping laboratory cultures correctly identified.

There is another angle to the differentiation of strains of *Brucella* from humans alone which is assuming economic importance. This applies to those people in industries who when ill are entitled to disability compensation under the Workmen's Compensation Act if it can be

shown that the disability was acquired in the line of occupation. For example, if a worker contracts undulant fever while employed in an industry which involves the handling of animals, let us say hogs, and he seeks disability compensation, he will find that before his claim is approved, it will either be necessary for him to prove that he handled carcasses infected with *Brucella*, which will be impossible owing to the lapse of time between exposure and the onset of symptoms, or that the strain with which he is infected is the one common to hogs. In addition he will also have to produce proof that he has not been working with other animals or has not used raw products from cows. This is not a theoretical example. Several cases of this nature have already been brought up where it was necessary to bring forth evidence to prove that the disability, undulant fever, was contracted in line of duty.

It is firmly believed that the method¹⁰ discussed below, which the writer has studied for the past 4 years, possesses all of the qualifications which one would desire for differentiating organisms within a genus. It is based on the growth inhibiting or bacteriostatic action of certain dyes when introduced into a medium suitable for the growth of *Brucella*. It has been employed in studying 656 strains of *Brucella* as to species. These strains were isolated from cattle, hogs, horses, goats, fowls, and humans, and came from all parts of North America, Europe and Africa.

It has been necessary to make slight changes in the technic, not because the method was faulty but to overcome possible discrepancies which seem to have had the faculty of creeping in as the study progressed. Many criticisms have been raised concerning the accuracy of the method. Some are justifiable, and it has been necessary to study and answer those. We have learned that dyes of certain manufacturers are not suitable for this technic; also, that only beef liver infusion agar of the correct formula gives accurate results. We also know that through long exposure or the incubation of plates containing the dyes in a room where there are reducing gases present, such as a 37° C. incubator, the dyes are reduced and their bacteriostatic action is impaired. The lower the concentration of a dye or the more it is reduced, the less effect will it have in inhibiting the growth of *Brucella*.

The differentiation method has been based on the employment of such dyes as thionin and either methyl violet or basic fuchsin. Thionin in a suitable final dilution completely inhibits the growth of *Br. abortus*, but not that of *Br. melitensis* or *Br. suis*. Methyl violet or basic fuchsin in a suitable final dilution will completely inhibit the

growth of *Br. suis* for 72 hours, but only slightly reduce the growth of *Br. melitensis* or *Br. abortus*.

In using thionin, it is important that the 1 per cent aqueous stock solution be thoroughly shaken just before it is placed in the medium, because the dye does not make a very stable solution in water. This is also true of basic fuchsin. If too long a time intervenes between shaking and placing it in the medium, the final concentration will be too low, and satisfactory inhibition of growth will not be obtained. The most satisfactory final dilution for thionin is 1-30,000, and for basic fuchsin 1-25,000.

We have also sought and found a dye possessing more uniform and constant bacteriostatic action against *Br. suis* than any of those of the triphenylmethan series. This dye is formo-rhodamine hydrochloride, commonly known as pyronin. Pyronin is soluble, and when made up in a 1 per cent aqueous stock solution, is stable. The final dilution which should obtain for completely inhibiting all strains of *Br. suis* is 1-200,000. By using different final dilutions of pyronin it is quite satisfactory for separating each of the 3 species. A final dilution of 1-100,000 permits only a slight growth of *Br. melitensis*, while all strains of *Br. abortus* give a luxuriant growth at this dilution. The stock solutions of all the dyes spoken of should be prepared by sterilizing the distilled water and dye powder separately before putting them together.

TABLE I

THE SOURCE AND CLASSIFICATION OF THE SPECIES OF BRUCELLA ACCORDING TO BEHAVIOR TOWARD DYES

Source	Number of Strains	Species		
		<i>Br. melitensis</i>	<i>Br. abortus</i>	<i>Br. suis</i>
Human.....	236	73	67	96
Bovine.....	263	4	249	10
Porcine.....	55	0	0	55
Caprine.....	35	35	0	0
Equine.....	16	0	11	5
Avian.....	2	0	2	0
Unknown.....	49	21	23	5
Total	656	133	352	171

Thus far, the dye method of distinguishing the species of *Brucella* has been extended to 656 strains* isolated from man and animals in

* Since the presentation of this paper a strain of *Br. suis* has been isolated from the testicle of a dog sent to this laboratory by Drs. Case and Planz of Akron, O.

continental Europe, Great Britain, Africa, Maltese Islands and North America (Table I). The strains of *Br. melitensis* from man and the goat were, for the most part, isolated in European countries. It is of interest to note that the goat has not yielded any strains of the other 2 species of *Brucella*. The 4 bovine strains of *Br. melitensis* were isolated from cattle in the United States and Switzerland. The 67 human strains of *Br. abortus* were from cases of undulant fever in the United States, Rhodesia and north European countries such as Denmark, Germany, and Sweden. The 11 equine strains of *Br. abortus* were, with 2 exceptions, isolated from cases of fistula of the withers in horses and mares by Dr. C. P. Fitch⁵ of the University of Minnesota and Dr. Van der Hoeden⁶ of Utrecht, Holland. The 2 avian strains of *Br. abortus* were from fowls in naturally infected flocks in the State of Michigan. The 96 strains of *Br. suis* were from cases of undulant fever occurring in the United States. No cases of undulant fever in any European country have thus far yielded a culture of *Br. suis*. The bovine, porcine, and equine strains of *Br. suis* were isolated in the United States. It would appear that hogs are refractory to infection by *Br. abortus* since not a single strain from this source has come into the hands of the writer. The 49 unknown strains were sent to the laboratory without any history. Many of these were isolated several years ago and had passed through several laboratories before reaching ours.

DISCUSSION

If the method of identifying the species of *Brucella* according to their behavior toward dyes is correct, it would seem that one can no longer doubt that *Br. abortus* is one of the causes of undulant fever in America and north European countries. This method substantiates the epidemiological data collected by students of the disease here and abroad.

The comparative pathogenicity of *Br. abortus* and *Br. suis* for man has been based largely on the number of successful recoveries of each in blood cultures. It is a well known fact that numerous cultures have been taken in cases of the disease with negative results. It has also been demonstrated that *Br. suis* can be obtained in culture from the blood with a greater percentage of success than can *Br. abortus*. Therefore, it is perfectly evident that at present one cannot say that *Br. suis* is the predominating species in undulant fever in America just because a greater number of isolations have been obtained. If *Br. abortus* is as pathogenic for man as the epidemiological and laboratory findings indicate, there is still to be answered the important question which has been raised many times: Why is the number of cases of

undulant fever due to *Br. abortus* so out of proportion to the number of individuals that have been exposed to infective material?

It is a well known fact that, of the thousands who take *Br. abortus* into their bodies when they consume infective raw milk or cream, a very small proportion develop undulant fever. The failure of many to become infected may be attributed to a native immunity to *Brucella*. Another hypothesis that has been advanced for the low incidence of infection as compared with the numerous exposures is gradually becoming a reality. Favilli⁷ first offered the suggestion that there might be a wide difference in the virulence of strains of *Br. abortus* and that possibly only a certain strain was pathogenic for man. Meyer and Eddie⁸ also made the same suggestion based on their difference in pathogenicity for monkeys.

We have observed that strains of *Br. abortus* differ markedly in their ability to reduce basic fuchsin in beef liver agar. Those that have been studied appear to divide themselves into 2 groups: one, when grown on plates of the dye medium for 72 hours, produces a zone of complete decolorization, which extends outward and around the growth to a distance of 5 to 15 mm.; the other, grown for the same length of time, produces only a slight decolorization. This difference in dye reducing ability is true of newly isolated CO₂ anaerobic strains as well as older aerobic ones. It has also been observed that those strains which decolorize the dye slightly rarely, if ever, produce the abundant growth that is produced by the intensely decolorizing ones. The interesting feature about the 2 groups is that those strains which are not active reducers of basic fuchsin appear to come from humans and cattle, while those that completely reduce the dye come only from cattle. About 80 per cent of the strains from cattle that have been studied belong to the latter group.

One of the problems that has interested us in connection with the study of the behavior of *Brucella* toward dyes and which we have spent considerable time in trying to solve, is the nature of the bacteriostatic reaction. Our data (to be presented in detail later) show that *Brucella* possesses a very active reducing system which operates on the food in the medium to make it available for the metabolism of the cell. The activity of the reducing system varies with the species of *Brucella*. When these particular dyes are added to the medium, they combine with the food, thus preventing or retarding its reduction, and prevent or retard the natural metabolism of the cell. In order for *Brucella* to grow, its reducing system must affect one or more of the dyes. *Br. suis* possesses a very actively reducing system for thionin, but not for fuchsin or pyronin. *Br. abortus* is able to reduce fuchsin and pyronin,

but not thionin in certain concentrations. *Br. melitensis* can reduce each of the dyes in question. Its reducing activity, however, is lower for pyronin than is that of *Br. abortus*. If one artificially maintains the dyes in a reduced state in the medium, there will be no inhibition of the growth of any *Brucella*.

Besides the identification of the species of *Brucella*, the dye method, combined with the determination of the activity of H_2S metabolism, plays an important rôle in separating two species when accidentally mixed or when they occur together in a single blood culture from a case of undulant fever. Dr. Borts, of the Iowa State Board of Health Laboratories, has twice separated from a blood culture *Br. abortus* and *Br. suis* and once *Br. abortus* and *Br. melitensis* by use of the dye method.

They are also useful in separating *Brucella* from bacteria of another genus that appear like *Brucella* in their morphological and cultural characteristics and cross agglutinability. One particular organism which the writer has in mind, and which could easily be confused with *Br. suis*, is *Pfeifferella mallei*. The natural host of this organism is the horse. So also is *Br. suis* sometimes found in the horse. The lesions produced in the guinea pig by both organisms through subcutaneous or intraperitoneal inoculation are not entirely unlike in character. Both attack the same organs, producing large necrotic abscesses, and cause abscess formation of the joints of the extremities. *P. mallei* is agglutinated by serum prepared against *Br. suis*, and *Br. suis* is agglutinated by a *P. mallei* antiserum. The reducing activity of *P. mallei* for dyes differs from that of *Br. suis* in that it gives a luxuriant growth on a medium in the presence of either thionin, basic fuchsin or pyronin. *P. mallei* is also a very active H_2S producer. This gas is produced in large amounts over a period of 10 to 15 days' incubation as determined by lead acetate paper. *Br. suis* produces very little H_2S after the 4th day of incubation. Cultures of supposed *Brucella* or *P. mallei* from horses should be examined very carefully by laboratory methods in order to avoid an erroneous classification which later might be disastrous.

The dyes which inhibit the growth of *Brucella* are now being found suitable as therapeutic agents for the successful treatment of undulant fever. Leavell, Poston and Amoss⁹ have found that the daily oral administration of small doses of the dyes brings about a complete recovery in chronic or resistant cases. Thionin is administered when *Br. abortus* is involved and methyl violet when *Br. suis* is the infecting species.

Pyronin should prove even of more value as a therapeutic agent

than the two dyes just mentioned because in low dilutions it is effective against all three species, and, if given slowly, it may be injected intravenously in a 1 per cent solution without harmful effects. Monkeys easily tolerate from 10 to 20 c.c. by the intravenous route.

SUMMARY

A total of 656 strains of *Brucella* from Europe and North America have been studied in their growth behavior toward aniline dyes in a suitable medium.

It has been found that these strains divide themselves into 3 groups or species according to the growth inhibiting action of thionin in a final dilution of 1–30,000, and pyronin in a final dilution of 1–200,000 in beef liver infusion agar at a pH of 6.6.

Of the total number, 133 have been classified as *Br. melitensis* (Bruce), 352 as *Br. abortus* (Bang), and 172 as *Br. suis* (Traum). *Br. melitensis* grows on both the thionin and pyronin dye medium, while *Br. abortus* grows only on the one containing pyronin and *Br. suis* only on the one containing thionin.

The strains of *Br. abortus* may be divided into 2 classes: those which completely reduce basic fuchsin (final dilution 1–25,000 in beef liver infusion agar), and those which slightly reduce this dye. It appears, on the basis of isolated cultures, that the latter class is the one that is pathogenic for man.

When more than one species of *Brucella* occurs in blood culture or other infective material, the dye method and H_2S metabolism determination will separate and identify each of the species.

The growth inhibiting action of these dyes, especially pyronin, offers possibilities in the therapeutics of undulant fever in man and *Brucella* infections in animals.

REFERENCES

1. Favilli, G. Different vitalita nelle agar-culture dei batteri della specie "*Brucella melitensis*," *Arch. di biol. normale e pathologica*, LXXXII—N. V. Firenze, 1928.
2. Valenti, E. Ricerca fisico-chimica dei costituenti specifici nella compaigne bacillare. I. Differenziazione del micrococco de Bruce dal bacillo de Bang, *Biochim. e terap. sper.*, Milan, 3: 77, 1927.
3. McAlpine, F. G., and Slanetz, C. A. Studies on the metabolism of the abortus-melitensis group. 2. Glucose utilization, *J. Infect. Dis.*, 42: 73, 1928.
4. Henry, B. S. Adsorption of agglutinins by "R" variants of bovine and porcine strains of *Brucella abortus*, *Proc. Soc. Exper. Biol. & Med.*, 27, 1: 8, 1929.
5. Fitch, C. P. Preliminary report on the relation of *Bact. abortus* Bang to fistulae, poll-evil, and other suppurations of horses, *J. Am. Vet. Med.*, 76, 1: 17, 1930.
6. Van der Hoeden, J. *Abortus bacillus* of cow (*Brucella* Bang) as cause of disease in horse, *Nederl. Tijdschr. v. Geneesk.*, 57: 15 (Jan. 1), 1930.
7. Favilli, G. *Loc. cit.*
8. Meyer, K. F., and Eddie, B. Further studies on pathogenicity of *Br. abortus* and *Br. melitensis*, *Proc. Soc. Exper. Biol. & Med.*, 27: 222, 1930.
9. Leavell, Hugh R., Poston, Mary A., and Amoss, Harold L. Administration of thionin and methyl violet in intestinal *Brucella* infection, *J. A. M. A.*, 95, 12: 860, 1930.
10. Huddleson, I. Forest. The differentiation of the species of the genus *Brucella*, *Technical Bull. No. 100*, Bacteriological Section, Michigan Agricultural Experiment Station, 1929.

NOTE: This work was aided by a grant from the committee on infectious abortion of the National Research Council and the Bureau of Animal Industry of the U. S. Department of Agriculture.

Agglutinins for *Br. abortus* in the Blood and Milk of Cows*

Use of the Agglutination Reaction in the Control of Certified Milk

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THE American Association of Medical Milk Commissions has in its regulations the statement that "No cow known or suspected to be diseased shall be permitted to remain in the milking herd." Acting under this regulation, the Wayne County Medical Milk Commission agreed to a tentative procedure in an effort to exclude from production of certified milk all animals which were to any degree likely to convey the organisms of undulant fever to the consumer.

The blood agglutination test with a *Br. abortus* antigen has been used for some time as a means of excluding possibly dangerous animals. The presence of agglutinins in the blood cannot be regarded as satisfactory evidence of active infection. While exclusion of producing cows on the basis of this test would certainly be a safe procedure, it would seem to be entirely too rigid a criterion for practical purposes. On the other hand, the actual isolation of bacteria of the *Br. abortus* group from the milk of each animal is impractical from the standpoint of a control laboratory, not only because of the laborious and time consuming technical procedure but also because negative findings would be of little value. The procedure agreed upon as worth a trial was to exclude from milk production those animals in which both the blood serum and the milk serum contained agglutinins for *Br. abortus*.

In order to obtain some data in regard to this requirement, during the past year both blood and milk reaction tests have been made on all cows producing certified milk on the five farms supplying Detroit.† To obtain more data on animals giving a positive blood test, 250 such cows on Farm A are included, although the milk is not part of the certified supply.

* Read before the Laboratory Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

† The laboratory work was done by James G. Thomas and Marguerite Novy.

The samples of blood were collected, allowed to clot and the serum removed in the usual manner. The milk samples were collected from each quarter of the udder separately, rennet added and the serum removed after transportation to the laboratory. At least 3 blood and 2 milk tests were made on each animal. The agglutination test was performed with Huddleson's antigen and the technic followed was that of Huddleson's rapid method, using the following serum dilutions: 1-25, 1-50, 1-100, 1-200, and 1-500. As a tentative procedure, serums showing agglutination in a 1-100 dilution or higher are recorded as positive, those showing agglutination in 1-25 or 1-50 are recorded as positive-negative and those showing no agglutination as negative.

The results of agglutination tests for each of the five farms are given in Table I. The practice at Farm A has already been referred to. At Farm B, Huddleson's non-agglutinating vaccine was being used during the period of the tests. The cows on Farm C had been vaccinated with a non-virulent agglutinating vaccine from 6 to 18 months before the samples were collected. On Farm E many more blood reactors were obtained than are shown in the table, but these animals were immediately disposed of and were not available for milk tests.

TABLE I

AGGLUTINATION OF BR. ABORTUS BY BLOOD AND MILK SERUMS

Farm A		Farm B		Farm C		Farm D		Farm E	
Blood	Milk	Blood	Milk	Blood	Milk	Blood	Milk	Blood	Milk
	+ 36		+ 3		+ 10		+ 2		+ 0
+ 71	± 6	+ 9	± 1	+ 43	± 3	+ 9	± 0	+ 4	± 0
	- 29		- 5		- 30		- 7		- 4
	+ 0		+ 0		+ 0		+ 1		+ 1
± 43	± 0	± 4	± 1	± 43	± 0	± 14	± 1	± 11	± 1
	- 43		- 3		- 43		- 12		- 9
	+ 0		+ 1		+ 0		+ 0		+ 0
- 193	± 0	- 81	± 0	- 32	± 0	- 26	± 0	- 64	± 1
	- 193		- 80		- 32		- 26		- 63

Six hundred and forty-seven cows were examined. Of these, 396 or 61.2 per cent were non-reactors to the blood serum test; 115 or 17.8 per cent gave an agglutination in serum dilutions of 1-25 or 1-50; 136 or 21.0 per cent agglutinated the antigen in a dilution of 1-100 or higher; 579 or 89.5 per cent gave no reaction in the milk serum at any time from any quarter of the udder. The milk serum from 14 or 2.2 per cent agglutinated the antigen in a dilution of 1-25 or 1-50 in one or more quarters at some time; 54 or 8.3 per cent showed agglutination in dilutions of 1-100 or higher. Since these gross figures are of relatively little importance, all the data have been separated so as to show

the number of positive or negative bloods giving positive or negative milk reactions. In Table II the results are combined and summarized. Of the cows showing no blood reaction 99.5 per cent gave no milk reaction; 95.7 per cent of the reactors in low dilutions (1-25 or 1-50) gave negative milk tests. For practical purposes it would appear that if a blood serum agglutination test is negative or positive with a serum dilution less than 1-100, the chances are small of obtaining a positive milk reaction. The exact significance, however, must depend upon ability to isolate *Br. abortus* from the milk.

TABLE II
SUMMARY OF AGGLUTINATION TESTS
647 Cows

		<i>Blood</i>								
		+			±			—		
Number		136			115			396		
Per cent		21.0			17.8			61.2		
		<i>Milk</i>								
		+			±			—		
Number		51	10	75	2	3	110	1	1	394
Per cent		37.5	7.3	55.2	1.7	2.6	95.7	0.25	0.25	99.5

Of the 136 blood reactors, 55.2 per cent gave no milk reaction; 7.3 per cent gave a reaction only in dilutions of 1-25 or 1-50; while the remaining 37.5 per cent were distinctively positive. Here also the significance of the negative milk reaction must be checked by further bacteriological data.

It is essential that the quarters of the udder be tested separately, since dilution might mask a positive test in one quarter. This possibility is indicated by the following data: the results of 100 laboratory tests showing at least 1 positive reaction in milk from the 4 quarters were picked at random. Of these, 26 were positive in 1 quarter only, 23 in 2 quarters, 17 in 3 quarters and 34 in all 4 quarters.

It is particularly desirable that all animals be tested after freshening (15 to 30 days). There were many instances where a negative reactor changed to a positive within a month after calving. Blood and milk serum tests during gestation are of relatively little value. A careful history of each animal is essential to proper interpretation of the reactions obtained in the laboratory.

That a positive blood test alone does not indicate active abortus infection is shown by the fact that many cows in this group have never aborted. Records over a period of several years were available on one of the farms.

Another fact noted was the rapid change in the milk serum agglutinin content in some animals. The antibodies may disappear completely in a few weeks, or a negative animal may become positive in the same time.

The following procedure is recommended as a practical control measure in connection with the production of certified milk.

1. A blood serum agglutination test with a *Br. abortus* antigen is made (a) on all producing cows twice a year, and (b) on all cows between the 15th and 30th day after freshening.

2. Samples of milk from each quarter separately are taken from all animals giving a positive reaction in blood serum dilutions of 1-100 or higher.

3. Animals showing any agglutinins in the milk serum from any quarter of the udder are immediately excluded from the producing herd.

4. The excluded animals are re-tested one month later, and if still positive are isolated from the certified barns.

NOTE: This work was done in the Detroit Department of Health. We are indebted to Michigan State College for some of the data here presented and to the several farms for their active coöperation.

Thus Saith the Lord

THE effort to promote and preserve public health by the pronouncement of edicts by or under authority of sovereign power is of ancient origin.

The ten commands of God respecting moral and civil obligations, written on tablets of stone and given by Moses to the children of Israel, are not older in time than that code of sanitary regulations for the preservation of the health and safety of the people, minute and particular in every detail, wherein God, through Moses, commanded his people to observe frequent purifications and cleansings; to isolate those suffering from communicable diseases; to disinfect houses where the plague had prevailed; to destroy infected articles; to avoid the use of unwholesome foods; and to protect the roofs of their houses by battlements, "that thou bring not blood upon thine house if any man fall from thence."—

(*Public Health and Safety*, by Parker and Worthington. Albany, N. Y., 1892, Matthew Bender, p. 37)—*Pub. Health Rep.*, Mar. 20, 1931, p. 632.

Public Health Control of Infectious Abortion in Certified Milk*

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HISTORICALLY the control of the *Brucella* infections as applied to certified dairies was initiated and subjected to careful tests by a series of developments which have been recognized during the past 15 years.

It has always been the opinion of those interested in the certified milk problems that for practical purposes this article of food as produced under the regulations for certification was a safe raw milk. However, it must be emphasized, and the fact credited to the sincerity of the certified milk movement, that when suggestions began to be offered and the efficiency of the control as well as the safety of the product questioned, groups of workers began to investigate the foundations on which the whole principle was based.

The Commissions, cognizant of their responsibility, always felt that within certain limitations a dependable safeguard had been erected by a rigid system of dairy hygiene. One weak link in the chain, emanating from the cattle themselves, existed in the diseases to which man is heir. At first tuberculosis played a leading rôle, then the streptococcic infections, and finally, through the observations of Fleischner and Meyer in 1915, the significance of the infectious abortion in certified herds was recognized. The original observation that certified milk may harbor the representatives of the *Brucella* group was made as early as August, 1915. Strain No. 80, now well known and extensively used for serologic tests, and in recent years designated as a *Brucella abortus suis*, was isolated at that time.

No effort was spared by the two workers mentioned to secure clinical or epidemiological evidence relative to the infectiousness of the certified milk consumed during 1915 and 1916. Since these inquiries were entirely negative and the trend of the prevailing discussion clearly indicated the lack of sufficient proof to incriminate the bacterium as

* Read before the Laboratory Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

harmful to man, the Milk Commissions decided to take an expectant attitude. However, the feeling of the members was clearly expressed in the conclusions which Fleischner and Meyer presented before the 68th session of the American Medical Association in 1917. They said: (1) For practical purposes *Brucella abortus* is always present in certified milk produced in the San Francisco Bay region; (2) it is of greatest importance to study the abortus problem from every angle to be absolutely certain of its bearing on the health of infants.

A study was made of 75 infants fed for from 1 to 12 months on a raw milk containing a large number of *Bacillus abortus*, and later supplemented by a group of 200 children in the age class 0 to 5 (unpublished data). Their serums were subjected to agglutination tests with negative results. With 2 exceptions, negative cutaneous allergic tests were also recorded. The 2 positive tests were in children suffering from bone tuberculosis of long standing and, in view of available knowledge at that time, were interpreted as nonspecific co-reactions due to general sensitization with tuberculo-protein.

Fleischner and Meyer introduced the intradermal tests not only in the diagnosis of animal infections in order to distinguish tuberculous infections from those caused by the *Brucella* organism, but also as an aid in the recognition of human infections due to the latter bacteria. Reports in the Italian and French literature at that time indicated that the customary serologic tests might be inconclusive in chronic or mild subclinical infections.

Since a diligent search over 2 years for acute *Brucella* infections in children had failed to reveal such conditions, it was reasonable to suspect that the disease existed, if at all, in the subclinical or immune stage and could probably be recognized by means of allergic tests. Unfortunately two important facts were not considered: (1) The past history of undulant fever was not carefully analyzed; the brilliant treatises of Hughes,¹ Cantaloube² and Eyre³ were superficially read and consequently it was not realized that the age group 0 to 5 in countries north of the 45th latitude possesses a very high immunity against this infection; (2) the nature of the "abortion reaction" was incompletely understood, consequently the evidence adduced from the clinical, serological and allergic studies was considered suggestive that *Brucella abortus* (bovinus) is non-pathogenic for infants and children.

Irrespective of the negative findings in 1917 and 1918 it was deemed important to approach the solution of the question in the mind of the Milk Commissions: "Is the *Bacillus abortus* discharged in the milk of dairy cattle infectious for man?" by various investigative routes. A few of the contemplated studies were completed. How-

ever, it was of considerable significance that in the course of a comparative analysis of a series of cultures, a *Brucella* strain originally isolated from a human patient in Austria was found to behave, culturally and serologically, like a *Br. abortus bovis*. Furthermore, feeding experiments on monkeys left no doubt that the *Brucella* organisms isolated from cow's milk, when administered by mouth in sufficiently large dosage, are pathogenic for these animals.

In 1919 the entire evidence was carefully analyzed, and it was pointed out that future bacteriological work might reveal a strain of *Br. abortus* which, in relation to its invasive properties, approached *Br. melitensis* more closely than those studied. A search for such a strain or strains was planned, but one member of the San Francisco Milk Commission (K. F. M.) was obliged to devote his entire attention to another problem of food sanitation and discontinued his studies on the *Brucella* group for 7 years. The San Francisco Milk Commission continued to take a great interest in the reports which gradually established a causal relationship between bovine abortion disease and undulant fever in man.*

In 1921 Bevan¹ reported the development of undulant fever in a number of human beings in Rhodesia, none of whom had consumed goat's milk. The evidence pointing to cattle as a source of infection was circumstantial, although subsequent tests by Orpen² showed these cases to be caused by the abortus type of the *Brucella*. Promptly, from widely separated parts of the world and the United States, cases were reported which were in all probability caused by organisms from bovine sources. By the end of 1925 the observations of Keefer,³ Evans,⁴ Carpenter,⁵ Huddleson,¹⁰ and others strongly indicated that the *Br. abortus* infections may assume an important public health aspect. The San Francisco Milk Commission was particularly alarmed by a case reported by Dickson.⁴†

No cases of undulant fever were recognized in California during 1926. However, the American Association of Medical Milk Commissions invited Drs. George H. Hart and Earle M. Dobbs of the University of California to discuss at the Twentieth Annual Conference at Dallas, Tex., April 20, 1926, the relation of *B. abortus* to public health. The authors concluded that the few cases of undulant fever reported in various parts of the world, including 12 in the United States which

* During the most critical years the San Francisco Commission seriously missed the counsel of Dr. E. C. Fleischner, whose untimely death doubtless deferred the organization of drastic control measures until 1927.

† A woman who had not been in contact either with goats or cattle was advised to consume 5 to 6 glasses of milk daily. She developed undulant fever with a positive agglutination test in a dilution of 1:500. Epidemiological studies showed that part of the milk consumed had been raw and abortus organisms were isolated from 2 cows in the dairy.

could not be traced to goats, were, in the light of the work done by well known investigators, cases of bovine origin.

The views expressed were fully shared by the Milk Commissions of the State of California and forcibly expressed at a meeting of the State Association in December, 1926. In fact, plans were discussed with Dr. C. M. Haring and members of the Division of Veterinary Science of the College of Agriculture, University of California, to apply to the certified dairies the system of control of Bang's disease so effectively administered since 1924 in a herd at a State Hospital.*

A number of developments during the first quarter of 1927 crystallized into a definite plan of procedure. In January, 1927, the Hooper Foundation was requested to examine a specimen of blood serum from a patient living at Morenci, Ariz. The serological study indicated an infection with *Br. melitensis*. Two cultures subsequently forwarded confirmed the diagnosis. In March another specimen of serum was forwarded from Los Angeles. The absorption test suggested an infection with the abortus variety. In the course of the next 8 weeks, 6 other specimens of blood serum of a series of 17 gave definite agglutination reactions with the abortus variety. These findings aroused tremendous interest, particularly since all the patients denied any contact with goats or goats' milk products. On the other hand it was claimed that all had consumed during the past 6 or 8 months large amounts of raw cows' milk. An attempt was made to determine the sources of the milk and the same number of dairies as there were patients were found to have furnished it.

The Commissions promptly recognized the significance of these scattered cases and, although no infections had been connected with the certified milk supply of the large cities, a serological survey covering the extent of brucellosis of the dairies was ordered. The tests were made in April, 1927, and approximately 20 per cent of the milch cows were thus found to give positive reactions indicative of an active past or latent but stationary herd infection. Market milk supplies of two dairies were tested on guinea pigs. They demonstrated the presence of *Br. abortus* in both specimens. The owners were instructed to proceed under the direction of the Division of Veterinary Science with the control of the infection by the segregation method.

Due consideration was given to these recommendations in the draft of the revised requirements of the California State Association of Certified Milk Commissions (Alameda, Los Angeles and San Francisco Counties) adopted late in 1927 and put in effect January, 1928.

* For details the reader is referred to *Circular 44*, California Agricultural Extension Service (Fred M. Hayes, Bang's Disease), University of California, 1930, pp. 17-24.

Paragraph 42 of the requirements which specify the control of Bang's disease reads:

After July 1, 1930, only animals free from *Brucella abortus* infections shall be permitted in a certified dairy, or to come in contact with any animal in a certified herd. The agglutination test of the blood serum shall be used for the determination of latent infections or carriers. The tests are only recognized by the Commissions when conducted by or under the supervision of the Commission's veterinarian. No animal shall be added to a certified herd until it has been tested for abortion disease by the Commission's veterinarian.*

The dairies complied with the requirements, but since the Commission for economic reasons desired to control the disease gradually over a period of a year and a half, several hundred reacting animals were removed when opportunities occurred to dispose of them. This prevented replacement by purchase and thus obviated conditions which in the long run would have jeopardized seriously the ultimate eradication of the infection. Irrespective of the defects inherent in a system of segregation in the dairy the number of reactors in the 4 certified herds was reduced as follows in 1928:

TABLE I

Herd No.	Av. No. Animals	Per cent	Periods
1	323	7.7	Jan., 1928
"	"	0.6	Dec., 1928
2	430	17.9	May, 1928
"	"	0.5	Dec., 1928
3	218	6.0	Jan., 1928
"	"	0.5	Dec., 1928
4	82	2.2	Jan., 1928
"	"	1.3*	Dec., 1928

* No effort made to remove reactors promptly.

The preliminary control work favored a prompt response and by May, 1928, the serum tests revealed 2 herds without a single reactor while the 2 others showed 1 and 2 respectively. The eradivative measures were very strict and the reactors were promptly removed from the farms. The histories of the herds for the year 1929 and the first half of 1930 are shown in Table II.

In order to verify the effectiveness of the control measures and as an additional check on the serum tests, the Division of Veterinary Science began a procedure which must be considered an important step toward the assurance of the Commissions and the consumer that certified milk is free from *Br. abortus*. This test, previously used in other states to recognize *Brucella* shedders in vaccinated herds, was intro-

* Repeated tests are now required.

TABLE II

Herd	Dates of tests and percentage of reactors in total number of animals tested							
	February 1929	March 1929	April 1929	May 1929	June 1929	August 1929	October 1929	November 1929
1	356 0.5%	—	—	304 0%	293 0%	—	—	—
2	—	436 0.4%	—	—	419 0.2%	451 0.2%	—	417 0.4%
3	—	—	—	215 0%	—	—	—	198 0%
4	—	—	202 1.4%	—	—	178 1.1%	214 0%	—

Herd	Dates of tests and percentage of reactors in total number of animals tested						
	January 1930	February 1930	April 1930	May 1930	June 1930	July 1930	August 1930
1	330 0%	2	—	—	258 0%	—	—
2	404 0.2%	419 0.2%	427 0%	409 0%	454 0%	—	—
3	—	—	—	253 0.4%	209 1.0%	210 0%	—
4	—	212 0%	—	—	211 0.4%	—	138 0%

duced into the routine tests of the dairies in the San Francisco Bay region. Since October, 1929, and every 30 to 60 days thereafter samples of certified market milk from each dairy have been collected and guinea pigs injected with the cream and sediment. The results have been negative with 1 exception.

It will be noted in Table II that Herd 3 suddenly revealed, in May, 1930, 1, and in June, 2 reactors. The blood serum of the cow detected in May, 1930, agglutinated in a dilution of 1:3,200; her milk serum reacted with the abortus antigen in a dilution of 1:100. She was one of the milking string of 50 cows. A sample of milk of this dairy bought in the open market was tested on guinea pigs. Typical abortus infections resulted. Additional guinea pigs were injected with market milk samples after removal of the cow. They revealed no lesions. The udder secretion of the reactor cow contained abortus organisms.

The actual dilution of this infected milk in the positive market sample is not known. From a practical point of view this is not necessary since the observation conclusively demonstrates the contamination of the milk supply by one animal. Absolute freedom from reactors is therefore an indispensable prerequisite for a certified milk.

In this connection it may be of interest to consider the sources of infection of the animals in Herd 3. A canal separates the farm from one which maintains a large dairy herd of which about 300 are infected with Bang's disease. The irrigation ditches for both farms lead from this canal and the possibility exists that water is the carrier. Large flocks of crows inhabit this territory. Frequently these birds feed upon aborted fetuses and placentas on the one farm and fly across the canal to the barn yard and feed racks of the certified dairy. There may be other sources of infection but either of the above may serve as the carrier. It is obvious that a certified dairy in the vicinity of a large reservoir of infection requires continuous and vigilant supervision.

The magnitude of the problems involved in the eradication of brucellosis is apparent when one considers the work and results obtained by the Los Angeles Milk Commission. Control measures were instituted in 1927. An initial survey in July of 3,071 animals revealed 38.2 per cent reactors distributed through 5 dairy herds. A system of segregation and replacement by purchase was instituted. Progress in the control program was at first quite rapid, and by 1929 the tests revealed approximately 1.7 per cent reactors. Only those who are familiar with the size of dairy herds in Southern California will appreciate that the producers of certified milk willingly assume a gigantic task in replacing in a very short time as many as 400 reactors on 1 farm. One should therefore not underestimate the disorganization and expense (cost of 16,000 serum tests in 6 months) entailed in the eradication of Bang's disease from large dairies. Formerly self-containing units entirely dependent on replacement by raising were forced to

TABLE III

Serum Test	Date	Per cent Reactors
First	July-August, 1927	38.2
Second	November-December, 1927	10.7
Third	February-March, 1928	5.4
Fourth	August-September, 1928	5.4
Fifth	December, 1928-January, 1929	2.8
Sixth	April-May, 1929	1.7

search the country for suitable milch cows free from disease. That they succeeded in some measure is illustrated by the data (Table III) which the President, Dr. Fitch C. E. Mattison, presented at the An-

nual Conference of the American Association of Medical Milk Commissions at Montreal, 1929.

Late in 1929 the Commission organized and now supports with the aid of the producers a well equipped laboratory entirely devoted to the medical and veterinary supervision of the products of the certified dairies in the Los Angeles district. Systematically the cows are tested at 30- to 60-day intervals. Market samples of each dairy are collected every week and guinea pigs injected with the cream and sediment of a specimen of 80 c.c. The work is conducted by Drs. C. W. Bonyng and J. P. Bushong.

The low incidence of reactors was unfortunately not maintained, largely because of the replacements by purchase. Although the herds were invariably stocked with negative reactors, animals with latent infections were probably introduced and the incidence of reactors rose from approximately 1 to 6.4 per cent. Consequently it was not surprising to encounter guinea pigs with definite abortus lesions. In general the anatomical, cultural, and serological findings were indicative of infections with few organisms, and the presence of abortus bacilli was irregular.

The analysis of the information thus far collected by the two Commissions suggests the following conclusions: (1) The eradication of Bang's disease in large dairies dependent for replacement of the reactors by purchase is a slow process; (2) the mixed market milk from such herds continues to harbor abortus bacilli in small numbers until the percentage of reactors is below 1 per cent; (3) although epidemiological investigations during the past 6 months, and serum tests on children who consumed this milk have failed to reveal undulant fever infections, it is the earnest desire of the Commissions to press vigorously the control measures until the number of the reactors is reduced to zero; (4) by comparison it is evident that herds in which no attempts are made to eradicate Bang's disease, and the percentage of reactors is large, unquestionably furnish a milk heavily infected with abortus bacteria; (5) certified herds which are subject to reinfection from neighboring herds and those which depend upon replacements by purchase must be subjected indefinitely to serum tests at intervals of from 30 to 40 days; (6) the Commissions should certify only milk which is free from abortus bacteria as shown by repeated guinea pig tests, preferably made at weekly intervals. Only cows known to be non-reactors to the agglutination tests furnish such milk.

Independent of the pioneering work done on the Pacific, the American Association of Medical Milk Commissions has discussed the public health aspect of Bang's disease at every annual meeting since 1925.

As a national organization devoted to the production of the highest quality milk, a great responsibility had to be assumed in deciding a matter which presented many controversial aspects. Two facts invariably deferred immediate action to compel the producers of certified milk to eradicate Bang's disease from their herds:

First, epidemiological studies had shown that although the majority of cases of undulant fever gave a history of having consumed raw milk, there remained a fairly large percentage in which other contacts with the *Brucella* organism were evident. In certain sections of this vast country, abortus fever is an occupational and not merely a milk-borne disease. The careful investigations of Kristensen and Holm definitely indicate that one-third of the 500 cases investigated in Denmark may be attributed to milk.

Second, it remains a noteworthy fact that great reluctance continues to be expressed in offering final conclusions and a solution for this complex problem. As late as 1929, Theobald Smith¹⁴ made the significant statement: "As to active measures against undulant fever, if it should be made fairly clear that the bovine race of *Br. abortus* is the real source of the other races then the time would be ripe for an active campaign against it."

It was therefore felt that adequate safeguards either in the form of pasteurization or elimination of the *Brucella* carrier in the herd must be instituted as soon as the actual rôle played by milk is definitely established. The papers read by Drs. I. F. Huddleson and J. G. McAlpine in 1928 before the Twenty-second Annual Conference at Minneapolis and the review presented by Dr. J. G. Hardenbergh before the Metropolitan Certified Milk Producers Inc. in February, 1928, amply testify to the trend of the deliberations. Furthermore, the presidential address read at the 1929 meeting of the American Association of Medical Milk Commissions at Montreal emphasizes the earnestness with which the entire problem was approached.

The speed with which the eradication of Bang's disease is to be undertaken was left largely to the discretion of the County Milk Commissions. However, a circular inquiry made during September, 1929, by the secretary of the association disclosed the fact that plans to eradicate Bang's disease in certified dairies all over the country were well under way. Some of the results reported were: 102 farms answered; 85 tested or tests under way; farms supplying milk from 100 per cent negative animals: 42, or 49 per cent; from 75-90 per cent negative animals: 15, or 17 per cent; from 66 per cent negative animals: 6, or 8 per cent; from less than 66 per cent, or not stated: 22, or 26 per cent.

It has been estimated that by the middle of 1930 approximately 80 per cent of the certified dairies were actively engaged in a program of eradication of Bang's disease. The procedures in vogue were blood tests every 60 to 90 days, segregation, disposal of reactors or suspects, cleanliness and disinfection, replacements by animals which gave negative tests. To the astonishment of everybody concerned, it was noted that 6 farms used vaccines. In one instance the producer tried to determine the degree of the herd infection by serum tests. Of 50 animals reported, 28 reacted positively, 20 suspiciously and only 2 were negative. In order to accelerate the control of *Brucella* infections in certified dairies the National Association adopted, June, 1930, the following rules pertaining to the control of *Brucella* infections:

It is required that elimination of Bang's abortion disease be actively prosecuted to the end that this disease be eradicated as early as possible from certified herds.

(a) No animal shall be used in the production of certified milk that shows positive evidence of infection with *Brucella* organisms.

(b) Herds shall be under the supervision of such agencies as shall be acceptable to the State Livestock Sanitary authorities and to the local Milk Commission.

As already mentioned the execution of the methods and standards is left to the County Milk Commissions. The National Association will try to collect reliable data regarding the progress of the control work and will doubtless publish from time to time the results or failures noted.

From the foregoing review of the trend of the various Milk Commissions toward the elimination of Bang's disease in the herds under their supervision it is evident that the entire problem has been approached with the facilities made available by those who have been engaged in this work for the past 5 years. Probably for many of the certified dairies the principles are not practical and the Commission will have to work out special procedures. For example, the important problem of the most economic disposal of the reactors requires some unified plan of action. To offer these animals for sale and thus to disperse them all over the country presents a great menace to the dairy industry.

In most cases the reacting cows represent valuable breeders which are eagerly sought by unscrupulous dealers to build up new herds. In order to prevent such dangerous practices the Commissions should insist that the reactors be segregated on separate farms far removed from the certified herd. The milk of these animals must be pasteurized, while the isolated herd may be used for the rearing of heifers free from abortion disease.*

* For details see *Circular 33*, California Agricultural Extension Service, College of Agriculture, University of California, 1929.

One is frequently asked: What results can be expected if the program of eradication is completely carried out? Since a great many factors in the epizootology of brucellosis and the epidemiology of undulant fever in man are still unknown, any statement would probably be contradicted by new facts discovered in the future. However, two possibilities should be considered:

First—The control and eradication measures now practised in many communities on a purely voluntary basis, although quite successful, may require legal enforcement. As an alternative, the co-operative plan known as the "Pennsylvania plan" may be adopted. Isolated farms free from Bang's disease contain highly susceptible animals, and when surrounded by infected herds are subject to catastrophic losses. Against such a possibility the certified dairy must protect itself by continuous serum tests at 30-day intervals. Until the dairy industry as a whole embarks on a plan to control Bang's disease, the position of the Brucella-free dairy will remain precarious and the efforts of the Commissions thus be nullified.

Second—Experience with regard to the elimination of Bang's disease by the segregation or eradication methods in certified dairies is based largely on the observations of livestock sanitarians throughout the United States. In California neither energy nor expense has been spared. With an unbiased mind the task has been undertaken and it is anticipated that it will be carried out successfully. The next 12 months will show if the milk of certified dairies can be kept free from Brucella organisms. Every effort will be made to keep the clean herds free from the disease. If the desired goal cannot be reached, then public health interests may remain assured that the Milk Commissions will be the first to introduce pasteurization of the milk under their care. In anticipation of such a possibility the American Association of Medical Milk Commissions appointed, in 1929, a Committee on Scientific Research, which will concern itself with approving, advising or actually directing certain research projects of importance to the dairy industry.

One of the principal projects, aside from the Brucella infections, which has occupied the attention of the committee deals with the study of the physical, chemical, nutritive, and bacteriological characters of milk as influenced by age, heat, cold, aeration, or exposure to various gases, radiation, contact with metals, etc. The necessity for such fundamental studies was admirably detailed by Dr. M. J. Rosenau at the Detroit Conference of the Milk Commissions. These studies, which would extend over a term of years, would then be followed by the second phase of investigation: a comparative study of the various

methods of commercial pasteurization and commercial pasteurizing machinery. Since the Medical Milk Commissions promote the production of milk of highest quality the pasteurization cannot be solely viewed as a safety factor, but the effect of heat on the nutritive factors in milk and many other conditions must be more definitely understood than hitherto.

Nobody will question the great benefits derived from pasteurization. However, the sanitarian and the consuming public are entitled to expect that the methods and supervisory control will be superior to those now generally in vogue should pasteurization of certified milk be undertaken.

With the knowledge now available the Commissions are left in a quandary as to the kind of equipment to be used in an individual or co-operative plant, the time and temperature, the extent of the supervision, and other matters. In fact, it would be very difficult at present to draft a set of regulations. Years of fundamental research are required. It is therefore hoped that in the meantime Bang's disease may have been banished from the certified dairies and that the problems which face the Commissions may be less serious.

REFERENCES

1. Bevan, E. M. *Tr. Roy. Soc. Trop. Med. & Hyg.*, 15: 215-231, 1921.
2. Cantaloube, P. *La fièvre de Malte en France*, A. Maloine, Paris, 1911.
3. Carpenter, C. M. *J. Infect. Dis.*, 39: 220-223, 1926.
4. Dickson, E. C. *J. A. M. A.*, 88: 631, 1927.
5. Evans, A. *Bull. Hyg. Lab. U. S. P. H. S. No. 143*, 1925.
6. Eyre, J. W. H. *Mittelmeerfieber*, in Kollé-Wassermann, *Handbuch d. pathog. Mikroorg.*, 2. Aufl., 4: 423-424, 1912.
7. Fleischner, E. C., and Meyer, K. F. *Am. J. Dis. Child.*, 76: 273, 1918.
8. Fleischner, E. C., and Meyer, K. F. *Am. J. Dis. Child.*, 18: 577-590, 1919.
9. Hart, George H., and Dobbs, E. M. *Proc. 20th Ann. Conference*, The American Association of Medical Milk Commissions, Brooklyn, 1926, 243 pp.
10. Huddleson, I. Forrest. *J. A. M. A.*, 86: 943-944, 1926.
11. Hughes, M. L. *Mediterranean, Malta or Undulant Fever*, Macmillan, 1897, 232 pp.
12. Keefer, C. S. *Bull. Johns Hopkins Hosp.*, 35: 6-14, 1924.
13. Orpen, L. T. T. *Tr. Roy. Soc. Trop. Med. & Hyg.*, 17: 521-524, 1924.
14. Smith, Theobald. *Medicine*, 8: 209, 1929.
15. Meyer, K. F. *Certified Milk Conferences*, 1929, pp. 7.

Further Studies on *Brucella abortus* in Certified Milk*

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IN a previous study of the certified milk sold in the city of Detroit it was found possible to detect, by plating methods, *Br. abortus* in the milk from 3 of 5 herds studied.¹ Two hundred and thirty samples of certified milk were collected and plated from December, 1928, to September, 1929, in an attempt to isolate members of the *Brucella* group. These samples were taken from bottles ready for delivery and were plated when at about the same age as milk reaching the consumer—from 30 to 48 hours old. *Br. abortus* was isolated from 10 of the 230 samples, the positive samples being obtained from but 3 of the 5 herds studied. Of the positive samples, an average of 2 organisms per c.c. was found, the highest count being 8.

Since September, 1929, steps have been taken by the Medical Milk Commission and public health authorities of Detroit to eliminate from these herds all animals which, on the basis of serological tests, were considered to be infected with *Br. abortus*.

This study was undertaken to answer the question: "Do animals which give negative serological tests excrete *Br. abortus* in their milk?"

The work consisted of an examination of the milk from each quarter of the udders of all animals composing the 5 certified herds producing milk for the city of Detroit. This included a bacteriological study by plating methods to isolate organisms of the *Brucella* group, and a serological study of *Br. abortus* agglutinins present in the milk serum. Records of blood serum agglutination on these animals were available through the courtesy of the Board of Health and owners of the herds, from which all data on blood serology were taken.

The specimens were taken from April, 1930, to August, 1930. Samples from each quarter, in separate sterile tubes, were immediately taken to the laboratory and examined. One-half c.c. of milk from each was placed in 0.1 c.c. portions on poured liver agar plates, making a total of 20 plates for each animal. These were placed in tall

* Read before the Laboratory Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

glass specimen jars in which from 5 to 10 per cent of the air was displaced by carbon dioxide. The jars were incubated at 37° C. for 3 days, at the end of which the plates were examined for the characteristic colonies of *Br. abortus*. Suspicious colonies were identified by means of cultural characteristics and agglutination with a positive serum.

After removing the milk used for bacteriological study, rennet was added to the remaining portion of the samples. On the following morning the clear milk serums which had separated were tested for the presence of *Br. abortus* agglutinins by a tube method. Five-hundredths of a c.c. of milk serum was added to 1 c.c. of antigen, giving an approximate dilution of 1-20. This dilution was run on all samples, which were kept at a low temperature so that all positive ones might be repeated in higher dilutions. The antigen used had a turbidity equal to 400 p.p.m. of silica, and was suspended in 0.85 per cent sodium chloride containing 0.5 per cent phenol. The tubes of the agglutination test proper were incubated at 37° C. and the results recorded on the second and third days.

Samples taken from each quarter of 465 animals in 5 herds were examined. The results are given in Table I.

TABLE I
RESULTS OF STUDIES ON FIVE CERTIFIED HERDS

Herd	Number of animals	Milk neg. for <i>Br. abortus</i> and agglutinins	Milk showing agglutinins	Milk showing agglutinins and <i>Br. abortus</i>
A	36	32	4	3
B	83	74	9	4
C	76	71	5	3
D	220	219	1	0
E	50	50	0	0
Total	465	446	19*	10

* These animals which were found positive by milk agglutination were immediately removed from the herds.

Of the 446 animals from which negative results were obtained in this study of their milk, only 14 have records of positive blood agglutination in dilutions of 1-100 or higher on their last blood test. Of these 14, 10 had been treated with *Br. abortus* vaccine, so the presence of agglutinins in the blood serums of these animals does not necessarily indicate infection.

Of 19 animals in which *Br. abortus* agglutinins were detected in the milk serums, all except 1 gave a record of positive blood agglutination in dilutions of 1-100 or higher upon their last blood test. The history of this animal shows a positive blood reaction in 1-500 dilution in 1923 and 1924, and abortion in 1926. Since that date, agglutinins

for *Br. abortus* have gradually disappeared, and in April, 1930, the blood serum was reported negative. Milk samples taken in May, 1930, gave positive agglutination in two quarters in 1-20 dilution; *Br. abortus* was not detected by plating methods.

Of the 10 animals from the milk of which *Br. abortus* was isolated, each gave a record of positive blood agglutination in dilutions of 1-100 or higher on the last blood test.

Table II shows the relation of the blood agglutination and results obtained in the bacteriological and serological study of their milk.

TABLE II

THE RELATION OF BLOOD AGGLUTINATION AND RESULTS OBTAINED IN THE BACTERIOLOGICAL AND SEROLOGICAL STUDY OF THE MILK

Total animals studied 465				
Blood agglutination negative 433		Blood agglutination positive 32		
Milk agglutinins negative 432	Milk agglutinins positive 1	Milk agglutinins negative 14	Milk agglutinins positive 18	
No organisms in milk 432	No organisms in milk 1	No organisms in milk 14	No organisms in milk 8	<i>Br. abortus</i> in milk 10

Positive Blood—agglutinins present in dilution of 1-100

Negative Blood—agglutinins not present in dilution of 1-100

Positive Milk—agglutinins present in dilution of 1-20

Negative Milk—agglutinins not present in dilution of 1-20

The results of the bacteriological and serological studies on the milk of the 10 animals from which *Br. abortus* was isolated are given in Table III.

A review of the results found in the separate herds shows that the milk from each animal in 2 of the herds was free of organisms of the *Brucella* group as far as could be shown by plating methods. Why were there no organisms found in herds D and E, while plating methods revealed them in the milk from 10 animals in herds A, B, and C? The probable answer is found in the original percentage of infection and the duration of the elimination process by serological tests in the separate herds. The process of elimination in herd D, on the basis of

TABLE III

A STUDY OF 10 ANIMALS FROM WHICH *Br. abortus* WAS ISOLATED. EACH ANIMAL HAS A POSITIVE BLOOD AGGLUTINATION

Animal		QUARTERS			
		R.F.	R.R.	L.R.	L.F.
1	Milk agglutination	1-20	1-100	1-100	1-40
	Organisms per c.c.	4	4	None	None
2	Milk agglutination	1-40	1-40	1-40	1-40
	Organisms per c.c.	2	None	18	None
3	Milk agglutination	1-100	1-100	1-40	1-40
	Organisms per c.c.	None	None	2	None
4	Milk agglutination	1-20	1-100	1-20	1-20
	Organisms per c.c.	None	52	None	None
5	Milk agglutination	1-20	Neg.	1-40	Neg.
	Organisms per c.c.	None	None	8	None
6	Milk agglutination	Neg.	1-20	1-40	Neg.
	Organisms per c.c.	None	None	10	None
7	Milk agglutination	1-200	1-100	1-40	Neg.
	Organisms per c.c.	650	58	28	None
8	Milk agglutination	1-40	1-40	1-100	1-100
	Organisms per c.c.	None	2	4	2
9	Milk agglutination	1-40	1-100	1-200	1-40
	Organisms per c.c.	10	10	8	15
10	Milk agglutination	Neg.	1-20	Neg.	Neg.
	Organisms per c.c.	None	8	None	None

Total number of milk samples	40
Number showing agglutinins	32
Number from which <i>Br. abortus</i> was isolated	19

blood agglutination, has been in progress for 24 months, whereas in herds A, B, C, and E it has been in progress only for 6 to 9 months. However, of these 4 herds, E had the lowest original percentage of infection; hence the completion of elimination has been more rapidly effected in this one than in the others.

SUMMARY

Samples of milk from each quarter of the udder of 465 animals in 5 certified herds were examined by bacteriological and serological methods in an effort to determine if animals which give negative serological tests excrete *Br. abortus* in their milk. In this series of animals, *Br. abortus* was not detected in the milk from any animal in which agglutinins were not also found in the same sample, nor was *Br. abortus* detected in the milk from any animal unless agglutinins were present in the blood serum in at least a 1-100 dilution.

REFERENCE

1. Hasley, D. E. *Brucella Abortus* in Certified Milk, *J. Infect. Dis.*, 46: 430 (May), 1930.

A Study of the Epidemiology of Undulant Fever*

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IN 1929 there were 1,305 reported cases of undulant fever in the United States. Some of these were reported through unofficial though reliable sources. Prior to 1925 a total of 128 cases was reported. In 1925, 24 cases were reported and since that year the number occurring annually has at least doubled that of the previous year. In the first half of 1930, 559 cases had been reported to the U. S. Public Health Service as compared with 256 cases for the corresponding half of the year 1929.

In 1929 the disease was present in every state of the Union. It is probable that some of the reported cases were incorrectly diagnosed, but it is almost certain that these would more than be offset by unrecognized and unreported cases. If the occurrence of cases continues throughout the current year at the rate shown in the first 6 months, the incidence rate of the disease in 1930, based upon the population of the whole United States, will be approximately 2 per 100,000, or about one-tenth that of typhoid fever. It may be pointed out that in the past many cases of undulant fever have been called typhoid fever, and as the correct diagnosis of undulant fever increases there will be a proportionate decrease in the typhoid fever rates. However, undulant fever probably will never equal typhoid fever as a public health problem in the United States, as has been reported in some European countries.

Prior to 1929 no seasonal distribution of cases was observed, each month showing an increase over the previous months except for minor variations. In 1929 the number of cases increased gradually from 27 in January to 160 in September, except for a slight drop in August. From October to the end of December they decreased. Thus far in 1930 the rise has been similar, though a greater number of cases have been reported.

From March, 1929, to March, 1930, I was engaged in Field Studies

* Read before the Laboratory Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

of undulant fever in various sections of the United States, and personally collected epidemiological data on 109 cases in 14 different states. Approximately two-thirds of these patients lived in cities or towns having a population of 5,000 or more, and one-third in rural districts. In the State of Iowa, Surgeon A. V. Hardy, working jointly under state and federal authority, carried on similar studies on 375 cases, making a total of 484 on which information was gathered.

The age distribution of our cases resembles that of other reported series, showing a comparatively low incidence in young children, and rapidly increasing in the period of adolescence and early adult life. The distribution between the sexes was nearly 3 males to 1 female.

TABLE I
INCIDENCE BY AGE AND SEX OF 463 CASES

Age Group	Males	Females	Total
Below 5 years	3	2	5
5-9 years	5	3	8
10-14	17	6	23
15-19	28	6	34
20-24	48	7	55
25-29	42	15	57
30-34	35	14	49
35-39	60	11	71
40-44	42	16	58
45-49	26	7	33
50-54	20	11	31
55-59	4	9	13
60-64	7	5	12
65-69	3	5	8
70 and over	2	4	6
	<hr/> 342	<hr/> 121	<hr/> 463

Generally speaking, the occurrence of only 1 case in a household was the rule. In 11 households more than 1 case was found, while in others an indefinite history of an undetermined fever in some previous year was obtained.

In 435 of our cases the information obtained was sufficiently complete to permit a classification into three distinct epidemiological groups: (1) Those having little or no contact with livestock or carcasses; (2) those having contact with livestock and carcasses in the meat packing industry; (3) those having contact with livestock on the farm.

The first group was composed chiefly of those living in urban communities, whose most probable source of infection was raw milk. The second was largely composed of persons living in cities, whose occupation was in some phase of the meat industry, including its by-products.

The third consisted almost entirely of persons living in rural communities, a majority being farmers. These may be conveniently called the milk, meat, and farm groups respectively.

One hundred and ninety-eight cases were placed in the milk group, of which 103 (52 per cent) were males and 95 (48 per cent) females. The meat group contained 44 cases, 43 (98 per cent) males and 1 (2 per cent) female. The farm group had 193 cases, 184 (95 per cent) males and 9 (5 per cent) females.

The Milk Group—This was composed almost wholly of professional and business persons, laborers (other than on farm or in meat packing industry) and students, the latter including school children.

The information received as to consumption of dairy products by persons in this group showed that 178 used raw milk regularly, while in 20 part of the milk used was raw and part pasteurized. Creamery butter, which is practically always made from pasteurized cream, was used by 181 (91 per cent) of the persons in this group. Nine used no butter. Cheese was used by nearly all, but rarely was the use of imported cheese found. Many different brands of American cheese were used, but no particular kind seemed to be associated with an unusual number of cases.

Generally speaking, cases of undulant fever are so scattered that it is unusual to find a group of cases associated with a common milk supply. However, in 9 occurring in Waycross, Ga., in 1929, none had significant contact with livestock, all used raw milk, and 8 used milk from the same dairy. Approximately half of the milk supply of the city was raw, and half pasteurized.

In two of the Waycross cases cultures of *Brucella* were obtained from the blood and both were of the *suis* variety. Cultures were not made from the animals in the dairy herd, but agglutination tests showed the presence of reacting animals. Since pasteurization of all milk became effective in Waycross, on March 1, 1930, there have been no new cases of undulant fever in the city. The epidemiological evidence suggests no other explanation than an infection with the *suis* variety of *Brucella* transmitted through milk.

The Meat Group—This consisted of 40 packing house employees, 2 butchers, 1 worker in a rendering plant and 1 employee of a plant manufacturing hog-cholera serum. The 1 female in this group was a packing house employee engaged in making sausage casings. The association of all the cases with pork and pork products is worthy of note. In this group 8 persons used raw milk regularly, 2 part raw and part pasteurized, 23 pasteurized milk regularly, 3 canned milk, and for 8 information was not complete.

The Farm Group—There were 193 cases, chiefly of farmers (including members of their families and farm laborers), veterinarians, and livestock dealers. One hundred and eighty-eight persons in this group used raw milk, 1 part raw and part pasteurized, 1 canned milk, and 3 no milk. In the great majority the milk was obtained from farm animals with which the patient came in contact repeatedly.

EVIDENCE OF INFECTION IN ANIMALS

In the dairy herds supplying milk to the cases of the milk group the presence of *Brucella* infection was proved by serological or cultural studies in 39. Three other herds contained animals regarded as suspicious as a result of agglutination tests. In 10 other cases the history of the presence of the infection was quite definite, though not proved by laboratory procedure. While this number seems small it should be remembered that most of this group lived in cities and had little information concerning the health of the animals from which their milk supply was derived.

Many patronized milk dealers who obtained their milk from 2 or more herds, from a milk producing area that was presumably infected. We may expect better information as to the presence of the infection in the area furnishing milk to cities, as health departments, physicians and veterinarians apply our newer knowledge of undulant fever.

The herds of cattle with which 53 of the cases of the farm group came in contact were proved positive by laboratory tests, and 11 others had animals whose blood showed a suspicious but not diagnostic reaction. In 33 additional herds the presence of the infection was reported, though not subjected to laboratory tests, and in 4 others the history was suspicious. Of 60 herds of hogs in Iowa with which cases of this group had contact, 24 were found positive on serological test, 17 suspicious, and 19 negative.

EVIDENCE OF INFECTION WITHOUT SYMPTOMS

There is probably no infectious disease that has suffered as much from misnomers as have the conditions due to *Brucella* infection. In man it has had at least 50 names, of which undulant fever is the least objectionable, but that may mislead in that the fever does not always show the wave-like curve. In veterinary medicine the term infectious (or contagious abortion) is based upon a prominent symptom, yet abortion does not always occur in infected pregnant animals. The more recent term *Brucelliasis* (or *Brucellosis*) signifies a state of infection with *Brucella* and includes all cases without regard to symptoms, geographic location, or other consideration except the etiologic

agent. It has been shown that persons may be infected with this bacterial genus without showing significant clinical symptoms.

In February, 1930, the Laboratory of Animal Pathology of the University of Illinois and the Hygienic Laboratory at Washington jointly tested the blood of 74 Illinois veterinarians, 13 workers of the Illinois laboratory exposed to *Brucella* infection, and 8 clerical employees of the laboratory, presumably not exposed. Sixteen of the 74 veterinarians showed the presence of *Brucella* agglutinins, 3 of these in dilutions of 1:80 or higher. Three of the 13 laboratory workers showed the presence of agglutinins, one in 1:160 dilution; 2 of the 8 clerical employees showed partial agglutination in 1:10 dilution.

Huddleson and Johnson³ applied the agglutination test to 49 practising Michigan veterinarians and 57 per cent showed the presence of agglutinins, 29 per cent reacting in 1:100 dilution or higher.

In Denmark, Axel Thomsen⁵ tested, by agglutination and complement fixation tests, 272 persons that had direct contact with cattle and 61 not having such contact. The no-contact group gave negative results; the contact group showed the following positive reactions to one or both tests:

NO. IN GROUP	REACTING POSITIVELY
65 veterinarians (1 yr. or more practice)	61
16 bacteriologists	10
21 herdsmen	13
25 milkers	6
23 herd owners	9
20 drovers	1
10 milk testers	1
25 butchers	5
12 meat inspectors	4

In view of such results the diagnosis of undulant fever should not rest solely upon an agglutination test but upon clinical symptoms, supplemented by serological, and, if possible, by cultural tests.

The question of the isolation and differentiation of the varieties of *Brucella* does not belong in a paper on epidemiology, other than to point out that all varieties have been isolated from human cases, and generally speaking the clinical picture produced by all varieties is similar. In a series of cases it appears that the symptoms due to the *abortus* are milder than those produced by the *suis* or *melitensis* strains, but in a single case an opinion as to the causal variety of *Brucella* can be but little better than a guess.

While it is desirable that as much light as possible be thrown on the differentiation of the varieties, it is a matter of small importance from the standpoint of the patient. The unfortunate individual finds

himself ill with a continued disabling fever no matter what strain is associated with his case.

Since all varieties of *Brucella* give an agglutination reaction against a common antigen, and when symptoms are produced all cases appear clinically identical, for epidemiologic purposes we should, at least for the present, consider the *Brucella* genus rather than the species or variety. All 3 varieties of *Brucella* have been isolated from cattle, the mammalian species of greatest importance from the immediate standpoint of the health official. Apparently the *suis* variety is able to infect nearly all species of domestic animals, and the possibility of the infection coming from unusual animal sources should not be overlooked in the epidemiologic investigations.

Up to the present, transmission from one human being to another by contact appears very infrequently, if at all. The finding of *Brucella* in the stools of patients by Amoss and Poston¹ warns us that such transmission may be possible.

Madsen² reports that in Denmark 7 out of 8 observed pregnant women aborted and in 2 of these *Br. abortus* was found in the placenta. This brings to mind the possibility of transmission from one human being to another in the course of obstetrical attendance of an infected case.

In closing, I wish to call attention to the tendency toward attributing cases to milk-borne infection. This is natural from the long period during which transmission of the caprine infection was thought to be entirely dependent upon the consumption of goats' milk. Madsen² reports that in Denmark about 40 per cent of cases are attributed to milk, and 60 per cent to contact with infected animals; while our figures show 45 per cent and 55 per cent respectively. It should be emphasized, however, that in the group attributed to contact many cases have consumed milk from their own infected animals.

The California State Department of Public Health³ in *Bulletin No. 50* states that raw milk should not be directly blamed unless one or more of the following conditions are fulfilled:

1. Shedding of *Brucella* in milk as proved by laboratory data
2. The extent of infection in the milk herd determined by agglutination test
3. Positive results from direct inoculation of guinea pigs with centrifugalized specimen of pooled milk
4. A history of recent abortions in the herd
5. A history of recent use of live organism *abortus vaccine* in the herd

In our work this standard was not applied, especially in the earlier part, but experience obtained during our investigations led us to stress the inquiry into the herd histories whenever it was possible to do so.

If the above mentioned requirements are kept in mind and inquiry is made as to the presence of *Brucella* infection in dairy herds and other farm animals, our rapidly accumulating epidemiological data will become more reliable and valuable, and our bacteriological support of the same will be greatly improved.

REFERENCES

1. Amoss, Harold L., and Poston, Mary A. Undulant (Malta) Fever; Isolation of *Brucella* from the Stools, *J. A. M. A.*, 93: 170, 1929.
- Amoss, Harold L., and Poston, Mary A. Culture of *Brucella* from the Stools and Bile, *J. A. M. A.*, 95: 482-483, 1930.
2. California State Department of Public Health, Undulant Fever or Brucellosis, *Special Bull. No. 50*, 1930.
3. Huddleson, I. Forest, and Johnson, Howard W. Brucellosis. (1) The Significance of *Brucella* Agglutinins in the Blood of Veterinarians, *J. A. M. A.*, 94: 1905-1907, 1930.
4. Madsen, T. Communication faite au Comité de l'Office International d'Hygiène publique dans sa session d'Octobre, 1929, *Bull. de l'Office International d'Hygiène Publique*, Paris, 22: 307-310, 1930.
5. Thomsen, Axel. Om Nogle Erhvervs Serologiske Reaktions forhold overfor abortenbacillen, *Kongelige Veterinær- og Landbohøjskole Årsskrift*, 1930. Copenhagen, p. 179 (Abst. in *Cornell Veterinarian*, 20: 319).

Italy's Maternity Insurance and Maternity-Welfare Work

THE law on compulsory maternity insurance of factory workers has been functioning in Italy for 17 years. The number of insured women increased from less than half a million in 1912 to more than a million in 1929. A still greater increase is expected to take place as the result of a law which went into effect in October, 1930, and which extends the compulsory maternity insurance to non-manual workers in a large number of occupations and to government employees.

The insured women are paid a benefit of 150 lire at the time of confinement, and those who are subject to unemployment insurance are also paid an unemployment benefit for 1 month before and 1 month after confinement, during which time they are not allowed to work.

Another feature of the maternity welfare work is the establishment of health centers for expectant mothers where they are given physical examinations and simple treatments, and are taught the rules of hygiene. A large number of such health centers have been established in the last few years by the National Children's Bureau of Italy; the National Social Insurance Fund administering the maternity insurance law has also begun to establish such centers.—*Le Assicurazioni Sociali*, Rome, 1930, 6, 5: 77, and various issues of *Maternità ed Infanzia*, official organ of the National Children's Bureau of Italy.

Minimum Qualifications for Those Appointed to Positions in Public Health Nursing^{*}

THE following definitions of desirable minimum qualifications for persons appointed to public health nursing positions are offered in the belief that they can be met quite generally by the year 1935. It is obvious that a higher level of requirements has already been reached in certain official and volunteer health organizations, particularly in the field of experience with communicable disease, and for supervisors in the matter of academic degrees. Minimum qualifications will be advanced with the years as the quality of nursing education and practical training is generally improved. Those offered here must be considered as representing a stage in development and progress.

STAFF POSITIONS

I. *For the Nurse on a Staff Providing Well Qualified Nurse Supervision*

Minimum qualifications for 1935:

- A. At least high school graduation or its educational equivalent as determined by the State Department of Education.
- B. Fundamental nursing education—namely:

Graduation from an accredited school for nurses connected with a general hospital having a daily average of 50 patients or more. Curriculum should include practical experience in caring for men, women and children, together with theoretical and practical instruction in medical, surgical, obstetrical, and pediatric nursing. Such experience may be secured in one or more hospitals.

It is highly desirable, in addition, that preference be given the public health nurse who has had training in communicable diseases (including tuberculosis and venereal diseases); psychiatric diseases and mental hygiene; and such specialties as diseases of the eye, ear, nose and throat; experience in outpatient clinics; and 2 months' affiliation with some well organized community health agency.

These services may be given in the school, as an affiliation with another school of nursing, or as a postgraduate course.

C. State registration.

For those nurses not meeting the educational and professional requirements of the above outline, occasional exceptions may be made, if profes-

^{*} Prepared by the Committee on Education of National Organization of Public Health Nursing and endorsed by the Public Health Nursing Section, the Committee on Training and Personnel, and the Committee on Research and Standards of the American Public Health Association, March, 1931.

sional training or experience has developed a wisdom and judgment which are valuable in the public health nursing field.

II. *For the Nurse Working Alone—i.e., Without Qualified Nurse Supervision*

Minimum qualifications for 1935:

A, B, and C, as above.

D. In addition it is desirable that she have had:

1. At least 6 weeks' instruction in public health nursing, preferably in one of the recognized public health nursing courses, and 1 year's experience under adequate supervision; or
2. Two years' experience under adequate supervision; or
3. A public health nursing course endorsed by the N. O. P. H. N.

Occasional exceptions may be made for those not meeting this academic and fundamental nursing standard, but such nurses should have proved their ability before being appointed for positions where they work alone, and should be expected to meet requirement D.

It is of primary importance that every public health nurse have suitable qualifications.

SUPERVISOR OR DIRECTOR IN A PUBLIC HEALTH NURSING ORGANIZATION *

I. *Supervisors*

It is expected that those appointed to positions of supervisory rank have the equivalent of the educational and professional background described as a standard for the staff nurse, namely:

- A. At least high school graduation or its educational equivalent as determined by State Department of Education.
- B. Fundamental nursing education—namely:

Graduation from an accredited school of nurses connected with a general hospital having a daily average of 50 patients or more. Curriculum should include practical experience in caring for men, women, and children, together with theoretical and practical instruction in medical, surgical, obstetrical and pediatric nursing. Such experience may be secured in one or more hospitals.

It is highly desirable, in addition, that preference be given the public health nurse who has had training in communicable diseases; psychiatric diseases and mental hygiene; and such specialties as diseases of the eye, ear, nose and throat; experience in outpatient clinics; and 2 months' affiliation with some well organized community health agency.

These services may be given in the school, as an affiliation with another school of nursing, or as a postgraduate course.

- C. State registration.
- D. At least 1 year's supervised experience in a well organized public health nursing agency.
- E. A public health nursing course endorsed by the N. O. P. H. N.

* For those nurses not meeting the educational and professional requirements of the above outline, occasional exceptions may be made if professional training or experience has developed a wisdom and judgment which is valuable in the public health nursing field.

In making promotions and new appointments to supervisory positions preference should be given to those with certain personal qualifications which, though difficult to measure, are vital to her work, such as special technical skill in the field she supervises, ability to impart information, to win confidence of staff, and to inspire voluntary requests for help; ability to delegate work with a fair balance in responsibilities assigned, and to stimulate initiative on the part of staff; ability to correlate work with that of other agencies in related health and social fields; breadth of vision covering both the aims of her profession and the work of her organization in relation to a unified community health program, with the initiative and imagination for developing new work.

II. *Educational Directors*

The educational director would need all these general qualifications together with advanced academic preparation including educational subjects if possible. It is especially important that, in addition to proven teaching ability, she shall show signs of imagination so that she can fit her individual and group teaching to the immediate needs of her staff and to the broader developments in the community's health program. She, as well as the director, must have the vision to be a few steps ahead of present practice.

III. *Directors*

The highest standard of qualification should be required of an executive director. She should have more than the minimum education required of her staff. It is desirable that she have an advanced academic preparation, preferably a college degree.

The director's experience should include at least 2 years in a public health nursing service, emphasizing family service. In addition she should have had experience as a supervisor, and, when possible, as an assistant executive director. She should have sound administrative ability to organize and direct the work.

Such a background would prove her teaching ability, her knowledge of technical skills, and her ability to cope with larger problems of organization and administration. Her distinctive contribution should be the ability to interpret the needs of her organization and of the community to her committee and board members, and to be a leader in community health developments.

The Mantoux Test

1. The Mantoux test is extremely valuable in children. It is easy to perform and is quite painless.

2. Care being taken to exclude the sources of error, . . . a negative result excludes tuberculous infection and is a comforting finding in debilitated children after measles, whooping cough, and broncho-pneumonia, and in cases of chronic cervical adenitis and so-called "intestinal indigestion."

3. A strongly positive result in young children suggests active tuberculous disease and usually justifies a bad prognosis.

4. A mild positive result indicates tuberculous infection (not necessarily disease), and children showing such a reaction would benefit from open-air treatment and increased prophylactic precautions.—The Mantoux Test, by Wilfrid F. Gaisford, *Lancet*, Mar. 7. 10

Observations on Industrial Hygiene*

A. J. LANZA, M. D., F. A. P. H. A.

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New York, N. Y.*

IMPRESSIONS gained from visiting industrial medical departments and inquiries received from industrialists and industrial physicians reveal a condition of affairs in the practice of industrial medicine marked by variations and dissimilarities in method and objective which at times amount to positive contradiction.

I am not endeavoring to raise the colorless banner of standardization, but it does seem that the time has come for a body such as ours to consider what should be the professional equipment of the industrial hygienist. This paper endeavors to deal with two questions: (1) Should the industrial hygienist be specially trained? (2) What are the facilities for such training and the use made of them?

A clarification of terms is essential here. We speak of industrial physicians and industrial hygienists, frequently using the terms in the same sense, whereas there is a wider difference between the two than between a general practitioner and a nose and throat specialist. Many industrial concerns consider their needs well met when they make available to their employees the services of a skilled surgeon, usually with the specific purpose in mind of satisfying their responsibilities under the compensation law. Obviously, the main requirement of the physician who undertakes this branch of industrial work is that he be a competent surgeon.

Industrial medicine has progressed far beyond this point and the majority of the larger employers of labor are looking for much more than repair work from their medical officer. We are faced by an ever growing intelligent demand from industry for the application of the principles of preventive medicine in industrial establishments and nowhere is there a greater opportunity for this branch of medical science.

The attitude of the industrialist is based on economics. Given a situation that presents a sound economic basis and an unlimited opportunity for action, there can be but one answer—progress. Here we have an industrial nation filled with mines, railways, and manufactur-

* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

ing plants of every conceivable type, commercial and financial establishments, employing 30,000,000 wage earners, most of them protected by compensation laws which are being expanded to include compensable illnesses; we have a persistent and increasing demand for the protection of the health and well-being of workers both from themselves and from those who employ them. Industry is interested not only in the treatment of disease but more so in its prevention. What a marvelous opportunity!

There is still a wholly inadequate conception of what this opportunity means in terms of the public health. Tuberculosis is an industrial problem; the prevention and control of heart disease is an industrial problem; the field of action for mental hygiene lies largely in industry, as does venereal disease control. In industry the association of numbers makes possible accomplishment on a large scale, and, by utilizing the industrial approach, preventive medicine can be carried through to the family.

The statement is frequently made by apparently well informed persons, including medical men, that any graduate of a class A medical school is competent to accept a position as medical director of an industrial establishment and fulfil the duties and responsibilities of such position in a satisfactory manner; yet I know instances of men with good all round medical training who have been serving factories for years and have been entirely unaware of the presence of occupational hazards in those plants until damage suits for occupational illness were filed against the firm employing them. I have had the experience of visiting several large concerns which had physicians in constant attendance, where in each instance there was a major hazard from lead poisoning and where also there were differing standards of diagnosis and treatment, none of which were tenable in the light of our present knowledge.

It is obvious that the physician who aspires to practise as an industrial hygienist needs special training before he can qualify in that capacity. To be sure, many industrial physicians acquire a fair working knowledge of industrial hygiene, while they are carrying on their routine duties in mine, factory, or commercial establishments. It is increasingly evident that industry is expecting from its medical officers definite activities aimed at the prevention of illness, which presuppose a type of training not possessed by the ordinary medical graduate. In other words, they expect these medical officers to be hygienists as well as physicians; but there is no more reason why a physician should essay the specialty of industrial hygiene without special training than the specialty of psychiatry, or nose and throat surgery.

The industrial hygienist should have a fair knowledge of the physiological aspects of ventilation and be able to correlate any given condition with the effective temperature chart. He should know enough about illumination to be able to measure the available light and estimate its quantity in relation to the job to be done, and be able to recognize glare and correct it. He should know under what conditions it is desirable to take air and dust samples, and what methods should be employed in taking air samples and analyzing them. He need not be familiar with the technic of analysis, but he should know when such proceeding should be resorted to, just as the general practitioner knows when a patient's tonsils should be removed though he may not practise that branch of surgery. He should know something about fatigue and posture in relation to efficient work.

The industrial hygienist should know enough about occupational poisons to be aware of those, if any, which are hazards in the plant under his care, and he should know the symptoms, methods of diagnosis and treatment of such poisons, and the means of controlling the hazards.

The industrial hygienist should have a working knowledge of statistical methods. An outstanding need in the public health field to-day is for morbidity statistics, especially in relation to occupation. There is more than one good industrial medical department with a conscientious and efficient medical director in charge, the value of whose work is largely unrecognized by his firm because of his inability to present the results in the clear-cut statistical manner which carries conviction. Over and above these technical subjects, the industrial hygienist will fall far short of his opportunities unless he appreciates the human problems of industry and can deal with them sympathetically.

He should know something of the problems of employment—whom to pass and whom to reject; what to do with the substandard man. The physical examination is becoming more and more an essential requirement for employment, and properly applied and followed up it is of tremendous benefit to the individual as well as to the industry. There is a danger, however, that industry will begin to believe that it can successfully pursue a policy of accepting and rejecting applicants for work on the same basis that the military forces recruit their strength. Nothing could be more fallacious. There are many thousands of persons who have physical handicaps of varying severity but nevertheless must work to support themselves and their families, and, moreover, are quite capable of working to good advantage if properly placed. It is unthinkable that these persons should be doomed to idle-

ness and charitable support for economic as well as humanitarian reasons. It is to the industrial hygienist that industry must turn in order to deal with this and similar questions, and industry is always ready to listen to informed and intelligent opinion.

If we admit that the physician who undertakes to practise in the preventive field of medical science as applied to industry should receive special training in the necessary branches of learning, then we must be concerned with the facilities for such training and the extent to which they are employed. Excellent courses are available, among others, at the medical schools of the following institutions: Ohio State University, Yale, Harvard, University of Pennsylvania, Columbia, and Johns Hopkins. Similar courses are available at some of the technical schools. The following brief descriptions are summarized from communications kindly furnished by officials of these schools:

Columbia—In the College of Physicians and Surgeons: 8 lectures in industrial hygiene to fourth year medical students, as part of the course in public health administration. To graduate students there is a comprehensive course, including technical instruction, as well as field work.

Yale—Three lectures in industrial hygiene; 2 conference periods, 1 factory excursion as part of the course in the principles of public health. This course embraces all medical and public health students. There is also a course of 30 hours of lectures and field work, which is elective for medical and graduate students.

Ohio State University—Senior medical students are required to take 6 hours of lectures and demonstrations in industrial hygiene. Ventilation and occupational diseases are dealt with. Since 1915 there has been available to upper class men and graduates a course in industrial hygiene, for 3 of the quarters of the year, 3 to 5 hours in each quarter. This is required of certain engineering groups, and is elective for medical, education, commerce, and art schools. There are always 2 or 3 students carrying on major research studies among registered candidates for Master of Science degrees. A number of students in the graduate school also elect minor research studies for theses.

University of Pennsylvania—Undergraduates: 3 to 4 lectures in industrial hygiene and health hazards. There is also an elective course for fourth year medical students covering 12 weeks, including lectures, laboratory, and field work. Graduates: a course in industrial hygiene, comprising 1 lecture a week for one-half year; 1 semester hour a week for one-half year; one-half day a week plant survey. The students taking this course are mostly candidates for Ph.D.; some are physicians.

Johns Hopkins—School of Hygiene and Public Health: A very complete course in physiological hygiene to furnish practical preparation for field work in industrial hygiene.

Harvard—In the Harvard School of Public Health are courses in industrial medicine embracing industrial toxicology, organization of industrial medical departments, factory sanitation and safety engineering; also courses in the physiology of respiration, including effects of dust inhalation, general circulatory physiology, neuromuscular physiology, including fatigue—all supported by laboratory experiments.

University of California—There are two courses in industrial hygiene in the department of hygiene. The students must have some prerequisites in hygiene and biology. One course is devoted to the principles of industrial hygiene, industrial physiology, prevention of occupational diseases, plant sanitation and safety. Another course embraces the organization of industrial health service, including lectures, laboratory and field excursions.

McGill University—This school offers special instruction in industrial hygiene and maintains in coöperation with the Montreal General Hospital an occupational disease clinic.

In these schools there are also courses in vital statistics which, if not included in, can be correlated with, the courses in industrial hygiene. All this is very satisfying and reflects great credit on the foresight and energy of the small band of enthusiasts who have developed these courses at the various schools.

Inquiry as to the number of persons taking these courses produces a feeling of anxiety. One university states there are 6 to 8 persons taking the work in industrial hygiene; another 4 to 8 students; another says the students vary from 2 to 8 or 10, only 1 having chosen an elective course; another had 6 students in 2 years for the industrial hygiene course; while from another comes the information that the attendance is growing steadily, but no definite number is given.

The total number is not imposing, and taking the largest figure in each case does not total 100. Moreover, not all of these are physicians or candidates for the M.D. degree. Probably less than half are physicians and of these only a portion will ever become actively identified with industry.

It is evident that the greater part of medical officers in industrial establishments are acquiring or have acquired their experience while working in the industry. Most of the good work that is being performed in industrial medical departments is built up on the pioneering efforts of courageous physicians who had vision and were not afraid to tackle something new. We are definitely emerging from the pioneering period. Not only is industry demanding more physicians, but the industrialist has learned that the degree of M.D. does not necessarily carry with it a knowledge of factory sanitation, specific occupational hazards, or how to handle men.

The medical schools are endeavoring to do their part. It remains for the physician himself, individually and collectively, to recognize the need for special training and to insist upon it as a requisite in the practice of this specialty as well as any other. Also I believe that there devolves upon this body the responsibility of defining minimal requirements for the practice of industrial medicine for the benefit of both the industrialist and the physician. The industrial hygienist

should emerge from the obscurity in which he has too frequently buried himself, and play a larger part in his community, both in his contacts with the community at large and in medical and professional associations. The presentation of his problems and achievements at medical gatherings would be of value not only to himself but to his fellow practitioners who in various capacities are continually increasing their contact with industry.

A year ago my predecessor, Dr. Rector, read an admirable paper entitled "What O'clock is it in Industrial Hygiene?"¹ In answer to his question, it is time to set off the alarm and arouse ourselves from a condition of satisfied somnolence.

REFERENCE

1. Rector, Frank L. *A J. P. H.*, 19, 12: 1327 (Dec.), 1929.

Effect of Factory Work on Motherhood in Germany

A STUDY of the effect of factory work on motherhood was recently made in Germany under the auspices of the Ministry of Labor and under the direction of Dr. Ludwig Teleky, chief medical inspector of factories of Prussia, and author of numerous works on industrial hygiene.

The study covers nearly 3,000 women and 7,700 children. For purposes of comparison the women were divided into two groups: factory workers, and housewives. In making the study the officials of the Ministry of Labor were aided by physicians and welfare workers connected with the health centers attended by these women.

It was found that the women who worked during the last few weeks of pregnancy gave birth to children of lighter weight than those who stayed at home during the entire period of pregnancy. Since this was not due to a difference in the social or economic conditions the authors of the report attribute this to the effect of factory work during the latter part of pregnancy. The percentage of stillbirths was greater among the factory workers. The infant mortality rate was higher among the children of factory workers than among the children of housewives, namely 126 per 1,000 live births against 106 per 1,000 such births. The difference in the mortality rate of the above two groups is particularly high beginning with the 7th week of the child's life, that is, the time when the mother usually returns to the factory and stops nursing her child.

The investigation took place in the Rhineland where the economic conditions are more favorable and where maternity and infant welfare work is better organized than in other parts of Germany. It is obvious, in the authors' opinion, that the data concerning the working women in other cities would show more serious effects of factory work.

The authors conclude their report with a plea for an extension of the work of the health centers and a better financial provision for the working mother so as to enable her to remain at home during the last few weeks of pregnancy and a considerable part of the child's infancy.—*Die Wirkungen der Fabrikarbeit der Frau auf die Mutterschaft. Arbeit und Gesundheit*, publication supplementary to *Reichsarbeitsblatt*, Heft 14, Berlin, 1930.

West Virginia's Public Health Program*

JOHN THAMES, M. D., F. A. P. H. A.

President, West Virginia Public Health Association, Charleston, W. Va.

DURING the past few years, West Virginia has experienced a rapid growth and development of public health service. We have made substantial progress in the solution of our peculiar public health problems and have developed a system of administrative practice in some instances well adapted to our governmental organizations and our political economy. In the beginning, with special studies of certain prevalent diseases, the problem of control was very slow and unsatisfactory until the state realized that a system of public health administration must be provided that would deal with our whole public health problem rather than with any one part. As a result, the state department of health has been materially strengthened. We have gone far in the strengthening of local health service and development of local health departments under trained leadership. The fact that we have made some progress should encourage us to make further progress. Much remains to be done. Local health service needs to be intensified and improved in its efficiency. The problems of counties and areas to which the present local health organization is not readily applicable must be solved.

Health education in some form has reached most of the population of the state through the many and various organizations, welfare and otherwise, using the word health as the key word for their advancement. People are awakening to the fact that there is a way by which the state and county authorities are able to institute measures that will lessen the dangers of child bearing and protect the children against preventable diseases. This plan of procedure has been so thoroughly demonstrated where it has been tried that its wonderful results have become apparent to all. A plan to organize health service, under the direction of trained leadership, that will serve the counties and areas not receiving such services would probably interest the legislature and county courts in making the necessary appropriations for administering the service.

In the undertaking of this task of making the public health ad-

* Presidential Address, delivered before the Annual Meeting of the West Virginia Public Health Association at Morgantown, W. Va., November 21, 1930.

ministration more efficient and effective there is no single element more important than that part which the physician may play. It has been thoroughly demonstrated to the satisfaction of the health organization that the attitude of the public and medical profession must be in accord in order that it may succeed. Any method of public health administration must recognize the principle that the public health and medical organizations jointly serve the public interest.

It is now recognized that preventive medicine and the administration of public health programs constitute a specialty of medicine. The health officer is a specialist in preventive medicine. It is his obligation and duty to instruct people how to keep well, to obtain an immunity status so far as possible, and interpose the necessary barriers to the spread of infections. He should restrict his activities to his specialty so as not to infringe on the physician's rights, or violate what is known as professional courtesy. The health officer is not in competition with the physician. His services are intended to strengthen the faith and confidence of the people. The health program will do more to increase the physicians' income than to curtail it, provided they accept it, and use it for that purpose. The object is to preserve the interest of the public and profession.

People have become so enlightened by reading magazines and syndicated news articles that it is essential that they be properly directed; otherwise there is great danger of their falling into the hands of charlatans and quacks, or that they may resort to patent medicines. Experience in public health administration indicates the soundness of the statement, "the practising physician is the most essential arm of preventive medicine," because every health officer knows that he is dependent on the physicians for discovery of cases, early diagnosis, and prompt reporting. One of the saddest mistakes a physician can make is to neglect this important duty he owes to society. In some instances he will not only neglect to report but will undertake to look after the danger of spread of an infection himself, which may get beyond his control, injure his reputation, and endanger the public. Then it is we have an unwarranted criticism brought against the health authorities that cannot be explained without exposing the physician.

In the administration of any public health program it is perfectly possible for the health officer to utilize the services of physicians to the credit of the medical profession. This is done in all places where the public health program is meeting with success, and is as it should be. The only chance for conflict or misunderstanding between a public health official and practising physicians is where the health officer is not sufficiently trained to stay within bounds of his specialty, or the

physicians do not try to acquaint themselves with the duties of a health officer, the neglect of which would make it very easy to misunderstand.

Public health service does not, and is not intended to, curtail a physician's income. It has a tendency to strengthen confidence and educate people to consult a physician when otherwise they would not do so. The large number of cases referred to the physician by members of the health service will increase his income, provided he takes advantage of the opportunity. Physicians should refer to the health officer all cases of drainage, garbage and sewage disposal, and water supply, or any condition that he may suppose to be dangerous to health. He should consult with the health officer regarding the occurrence of contagious diseases in his practice. In this way, a satisfactory conclusion may be reached and measures adopted by the health official that will prevent an epidemic, thereby preserving the interest of physicians and health officer, together with protection to the public.

It is about time for the industrial corporations to understand that they are liable for certain preventable diseases occurring among their employees as they are responsible for accidents resulting from imperfect, improperly adjusted, or unprotected machinery. It is believed to be right and just for the compensation commission to have the authority to require any employer to provide sanitary living conditions for his employees, to require them and their families to be immunized against typhoid fever, diphtheria and smallpox, with a distinct understanding that when anyone is permitted to work without being so protected—which may result in a case of typhoid fever, diphtheria, or smallpox—the employer shall be considered responsible and be required to compensate the employee to the full extent of injury incurred by him or any of his family having a case of typhoid fever, diphtheria, or smallpox. While this protection is advised for anyone employing labor it can be enforced only where there is an organized health unit with a trained health officer having jurisdiction to instruct and see that the preventive measures are properly carried out.

Public health service is a business enterprise dependent upon the public for its successful maintenance. The public will not be interested in any project until it knows something about its purposes and accomplishments. Members of county courts are selected business men, elected to that position by the people. They cannot be expected to continue to make levies sufficient to support health work unless they are satisfied that their constituents, the people whom they serve, are satisfied that the health unit is for their good and the money spent for that purpose is producing good results.

People will not respond until they are approached in a proper way and understand something of its merits. As a business, health must be advertised. In addition to personal contact and other methods, newspaper publicity must be used. Short newsy informative articles thoughtfully prepared by the health officer, or an occasional interview will be accepted by newspapers. In this way, the public can be regularly informed of the activities of the service, and it gives the health officer an opportunity to perform a duty he owes the people by giving them public notice of any impending danger arising from some general insanitary condition which he desires the public to assist him in correcting. He can at least let the people know of the existence of contagious diseases and what they should do to prevent them.

This association recognizes all unofficial agencies doing any kind of health work within the state. We congratulate them on the splendid results they have achieved.

The executive committee decided, on account of the approval by the health association of the organization of the West Virginia Child Health Council, recommended by the White House Conference Committee, to discontinue for the present the organization of county health associations and allow the State Child Health Council to organize component county child health councils, which include the representatives of all existing unofficial agencies. How far they have succeeded in organizing the state we are unable to report, and beg leave to have the Child Health Council make its own report.

I desire again to remind the members of the West Virginia Public Health Association that while wonderful progress has been made, there is much to be done. Let what has been accomplished act as a stimulus for us to redouble our efforts for greater achievements. We will let nothing swerve us from our duty. Remember, when things look blue and we are inclined to become discouraged on account of insufficient funds with which to work, that there is an old motto we might apply, "He that does no more than he is paid to do, will not be paid any more than for that which he does."

I wish to thank you for the confidence reposed in me by advancing me to this high office. I gladly surrender the gavel to my successor and wish for his great success, for I feel that you will accord to him the same generous and loyal support that you have to me.

EDITORIAL SECTION

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THE MEDICAL SECTION OF THE WHITE HOUSE CONFERENCE

THE Section on Medical Service, of the White House Conference on Child Health and Protection, held its final meeting in Washington, D. C., February 19–21, 1931. This was a fitting climax to a noteworthy undertaking. It brought together outstanding investigators in the field of child hygiene and made possible an exchange of professional ideas scarcely likely to occur under less auspicious circumstances. In earnestness of purpose and character of personnel it was reminiscent of similar meetings in the heyday of the American Association for the Study and Prevention of Infant Mortality. It was interesting to note how many of the pioneers in this movement were present.

Very impressive was the breadth of view, and at the same time the detailed study, evinced by various speakers in different group meetings of the Conference. The reports presented there reflected careful and exhaustive investigation and were phrased with true scientific caution. The committee reports had been thoroughly discussed in preliminary meetings, and common agreement reached upon all points presented, before the final meeting took place. Ample opportunity was afforded for discussion of controversial points in these sub-committee meetings, but fortunately all such matters were omitted from the final reports.

The popular night session, in which results of a nation-wide survey regarding utilization of medical facilities for the preschool child were

discussed, aroused a great deal of interest and commanded rapt attention. The information was presented concretely and illustrated with charts that were clearly understood. While the limitations of such a survey were pointed out, the facts presented were so convincing that they could not have failed to arouse in every representative a determination to return to his district and verify them, while at the same time devising means of looking after the preschool children more thoroughly.

The Sub-committee on Growth and Development had assembled an enormous amount of material which was thoroughly digested and admirably presented. Its discussions centered upon criterions of growth and development, nutrition, and the various factors involved in promoting growth.

The Sub-committee on Maternal and Infant Mortality sounded a challenge to all interested in child welfare. It clearly defined the limitations of present care during maternity and depicted the distance still to be traveled if proper care for mother and new-born baby is to be furnished. The need for better training of our medical students in obstetrics and the importance of prenatal and nursing care were vigorously stressed.

So much detailed technical material was presented to the Conference that it needs to be studied carefully, item by item, in devising ways and means to make proper application to local conditions. A supplement embodying the entire transactions of the final meeting was published April 6 by the *United States Daily*. This should prove a valuable reference in orientating us toward much better care of both mother and child. It is encouraging also to learn that a follow-up committee is in process of formation for the purpose of studying the reports and coming to a better understanding regarding the formulation of plans for more effective procedures. Those having the prime responsibility for the Medical Service Section are to be congratulated upon the success of its labors.

THE TYPHUS-ROCKY MOUNTAIN SPOTTED FEVER GROUP OF INFECTIONS IN THE EASTERN AND SOUTHEASTERN STATES

RECENT observations made by Dyer, Badger, and Rumreich, working at the National Institute of Health of the U. S. Public Health Service, are of great interest from a purely scientific point of view and will have a bearing on the control of certain infectious diseases from an administrative point of view.

It has been found that fleas taken from rats living in an environment which has furnished cases of typhus fever have given rise to a virus infection in laboratory animals closely simulating, or identical with, typhus fever. It has long been recognized that the typhus occurring in the eastern and southeastern states could not be attributed definitely to person-to-person infection by means of body lice, the recognized vectors of this disease in Europe, and of the same disease existing under the name of "tabardillo" in the central plateau of the Mexican Republic.

The observations referred to strongly indicate, as has been suggested by others, that rats and their parasites may play an important part in the maintenance of the focuses of typhus fever in our eastern and southeastern urban communities.

A second observation of great importance was the demonstration that certain of the cases that superficially resembled typhus were in reality due to an entirely different virus infection, one that could not be distinguished with any certainty from the infection of Rocky Mountain spotted fever of the western states, although there were minor points of difference between the two. Present evidence suggests that this infection, hitherto unrecognized in the eastern states, is transmitted by the common eastern dog tick *Dermacentor variabilis*.

Cross immunity tests clearly showed the lack of identity between this newly described virus infection and the typhus with which it had been confused for some time, but such tests did show strong affiliations with the Rocky Mountain spotted fever of the western states. With our present methods, cross immunity tests are to be looked upon as giving us practically conclusive information on such a subject.

Very briefly, the clinical distinctions between the endemic typhus, or Brill's disease, and the more recently recognized infection of the Rocky Mountain spotted fever group are: (1) In the Rocky Mountain spotted fever type of infection the duration of the temperature is irregular, sometimes as short as 7 or 8 days, and in others as long as 3 or 4 weeks, while ordinarily cases of typhus terminate by crisis rather regularly about the 14th or 15th day. (2) The eruption in the Rocky Mountain spotted fever type of infection is likely to begin on the extremities and is prone to be petechial in nature, while in the typhus cases the eruption usually appears first on the thorax and is less likely to be definitely hemorrhagic. The face is much more frequently involved in the spotted fever type than in the typhus group.

Finally, in the way of clinical distinction is the fact that while the typhus cases have long been recognized as giving almost no fatalities, the death rate in the Rocky Mountain spotted fever type, as seen in

the eastern states, is approximately 20 per cent. In general, the cases of the spotted fever type are distinctly more severe than those in the endemic typhus group.

Drs. Dyer, Rumreich, and Badger are to be congratulated on the attainment of such specifically clear-cut results, and it has been again demonstrated that the U. S. Public Health Service, through its National Institute of Health, has been alert in recognizing the importance of the problem of eruptive diseases of the virus group, and has been rewarded by the successful outcome of the experiments and observations undertaken.

REFERENCES

1. *Pub. Health Rep.*, 46: 334-338 (Feb. 13), 1931.
2. *Ibid.*, 463-469 (Feb. 27), 1931.
3. *Ibid.*, 470-480 (Feb. 27), 1931.

HYDROGEN CYANIDE FUMIGATION

THE increased use of hydrogen cyanide, which is our best method of destroying rats and vermin, for the disinfection of ships arriving from foreign ports as well as its use on land, has brought up some interesting questions which have been studied in England.¹

The conclusions are that the absence of a pronounced taste or smell cannot be taken to show that the food is fit for use. Moist foods absorb more than those which are dry.

The fatal dose of hydrogen cyanide is set at 60 mg., and the permissible quantity has been fixed at from 40 to 50 mg. per 100 gm. It is reported that materials like dates, figs, bacon and sausages which contain from 278 to 890 p.p.m. were after ventilation lasting for a week consumed without ill effects, analyses showing as a rule less than 20 p.p.m. It appears that in foods which contain levulose, a cyanhydrin which is stable in the air and probably not toxic is formed. With dextrose, this is produced only in the presence of an alkali. When potassium cyanide is employed both form cyanhydrin. Certain foods do not deteriorate on exposure to this material, while tea, coffee, and tobacco are said to lose their flavor. Some fruits are injured, while others are not, oranges especially being unhurt, while vegetables unprotected by a thick skin, like cabbage, celery and lettuce, may show wilting.

The use of hydrogen cyanide on living plants is recommended for the destruction of insects, and as the material diffuses slowly into the plant tissue, it can be used in high concentration for effective times. Bacteria and molds are more resistant than the higher plants and HCN has little or no practical value as a disinfectant.

The report concludes that with ordinary precaution, no serious risk is involved in the use of gaseous hydrogen cyanide for the purposes mentioned. The work must be controlled by experienced operators and high concentrations avoided when possible.

REFERENCE

1. Monier-Williams, G. W. *Reports on Public Health and Medical Subjects. No. 60. The Effect on Foods of Fumigation with Hydrogen Cyanide.* H. M. Stationery Office, 1930.

SIGHT SAVING

THE Sight-Saving Review, Volume 1, No. 1, comes to our desk. Its object must appeal to everyone, whatever his particular line of endeavor may be.

The new Journal is designed specifically "to meet the needs of state and local prevention of blindness workers, educators, illuminating engineers, school physicians and nurses, safety engineers, public health administrators, industrial physicians and nurses, sight-saving class teachers and supervisors, ophthalmologists, and any one interested in the sociologic aspects of saving sight." The Editor, Lewis H. Carris, is assisted by a Board on which are a number of well known persons. The printing and make-up are excellent.

We welcome the new Journal, and wish for it the wide success it deserves.

TOO MUCH HEALTH PROPAGANDA?

ALL wise teachers of preventive medicine have recognized that there should be a happy balance between the inculcation of fear of disease and the love of health. For the average person, except those in the prime of youth, the fear of death seems to be the greatest incentive to the cultivation of health. Many teachers pursue the method of evangelists, who picture the terrors of hell and damnation until their hearers are "converted," and then dwell upon the blessings of love.

This general topic has given rise to considerable discussion through some radical statements recently published.¹ We suffer in this country particularly from fads, the prevailing ones relating chiefly to diet, because of the many statements of "food experts" whose attention is for the moment riveted chiefly on vitamins. No less authority than Hinhede has said that "America is vitamin crazy." Most of these faddists lack education; many need employment; and, without doubt,

some belong to a class not entirely normal mentally—though it must be remembered that “The mind forges strange fetters for itself,” and even so great a man as Bishop Berkeley held that this material world was nothing, and tar water was everything.

The marvelous things which bacteriology has revealed are responsible for the fact, noted particularly in women, that germs have largely taken the place of the evil spirits of old, as Aldous Huxley has pointed out.

The great prominence given to intercollegiate athletics, under the pseudonym, physical education, is also responsible for some of the present evils. We hear such expressions as “utterly fit,” “positive health”; and all sorts of preposterous food habits, exercises, and stunts are indulged in to attain this object. The number of sudden deaths of elderly men on golf links, for example, has been well parodied in the epitaph, “I was well, I wanted to be better, and here I lie.”

The article referred to states that there is an American book prescribing physical exercises for infants of 5 months, and there are parents who put their babies through absurd training. Some cases turn out well, but the relation of cause and effect has not been demonstrated. In this country, for several years past, we have devoted much attention and an enormous amount of printer's ink to periodic health examinations, and widespread campaigns have been put on by associations devoted to one form or another of health propaganda, urging early diagnosis for tuberculosis, cancer, etc., with excellent results.

The plain facts seem to be that in infancy and childhood we have accomplished a tremendous saving of illness as well as life. In the middle ages, we have postponed death, while for later years we have accomplished but little. Once before in these columns we have combated the idea, formerly taught by many physicians and even some health officers, that it was better to have the contagious diseases while young, on the ground that they were like debutantes—one must take them young or they go hard. We can but maintain the same general attitude. Such examples as the practical elimination of typhoid fever during the World War, the cleaning up of Havana, the Panama Canal Zone, and other focuses of yellow fever, must for all time prove the wisdom of proper precautions for the preservation of health, and it would be criminal not to teach them, even at the expense of evolving some hypochondriacs.

There will always be health faddists, at least until everybody is entirely normal mentally, but this will not come during the time of anyone now living. We cannot but deprecate the plan of dwelling too much upon disease and creating morbid fears which are anything but

beneficial to the general health. Fear is not a good steady diet, in either religion or health. It may "convert" some, but it does not keep them good. It acts in health matters just as it does in religion—people are good only so long as they are frightened. We are very much like the small boy who prayed at night, but said he could take care of himself in the daytime.

In spite of the damage which we believe has been done by faddists, and those who use fear of ill health for money making purposes, we believe that they have done some good in making the general public ask questions and seek knowledge concerning the body, its normal functions, and diseased conditions. It seems certain, as pointed out by one writer, that in tuberculosis, and probably other diseases, fear has lost its hold. Except in cases of phthisiophobia, fear has not been active in this matter for a long time. Consumption, like the poor, is always with us, and even the extensive campaign which has been going on for the last 25 years against this disease has not awakened an untoward sense of fear in the general public.*

Our feeling is that health teaching and measures for the protection of health must go on. Our great effort should be directed toward the elimination of half educated faddists and uneducated educators. The teaching should be done by people sound mentally as well as physically, who have had proper training, who will avoid exaggeration, and both teach and practise the precept of Saint Paul, "He that striveth for the mastery is temperate in all things."

* It is interesting to note that many religious publications have called attention to the falling off of evangelism and revivals. Only a few stars can now make more than a bare living at this calling.

REFERENCE

1. Hutchinson, Robert. *The Pursuit of Health, Canad. Medical Association Journal*, Jan., 1931, p. 16.

AMERICAN PUBLIC HEALTH ASSOCIATION YEAR BOOK

FOR the first time in the sixty years of the Association's existence a *Year Book* has been issued and is now ready for distribution. Its aim is to provide in a single convenient place all of the committee reports presented at the Fifty-ninth Annual Meeting in Fort Worth, Tex., October 27–30, 1930, and the information concerning the organization, activities and membership of the Association which its members and others may require.

It has been issued in response to insistent demands, reiterated yearly, to publish important committee reports as soon as practicable after their presentation at Annual Meetings. Since 1911, these valu-

able contributions to public health practice and development have appeared in the *American Journal of Public Health* at some time during the year following their delivery. This practice has necessitated delay in making the material available; and even after publication, health workers have frequently been at a loss to know in which volume of the *Journal* a particular report appeared.

It has often been difficult for members to obtain needed information about the Association without consulting many books, bulletins, reports and transactions, or communicating with the central office. Furthermore, no complete list of members and Fellows has been printed since 1927, and the requests for such a roster have been numerous.

The *Year Book* brings all of this material together. The committee reports are published in full, together with the essential facts concerning the work of the Association. The corrected membership list is complete and accurate as of November 1, 1930.

This volume, therefore, should be a useful reference for every public health worker who needs to have at hand brief, concise and accurate information upon the widely varying aspects of his work. The committee personnel is appended to each report and committee members will welcome correspondence when further information is required. The book should be of importance to those members and Fellows who want more than a casual knowledge of the Association to which they belong, and to those who are frequently called upon to serve the organization, on committees or otherwise, it should be indispensable.

ASSOCIATION NEWS

MONTREAL COMMITTEES ON ARRANGEMENTS

THE Chairman of the Local Committee on Arrangements, Dr. S. Boucher, Health Officer of Montreal, announces the appointment of the following sub-committees and their respective Chairmen:

Entertainment—Dr. A. Grant Fleming
Inspection Trips—Theodore J. Lafreniere
Information, Registration, etc.—Mac H. McCrady
Finance—J. Versailles
Publicity—Dr. A. B. Chandler and Dr. J. A. Boudoin
Membership—Dr. Starkey
Ladies' Entertainment—Mrs. Creelman and Mrs. Beaubien

Plans for the registration, housing, and entertainment of the 1,500 dele-

gates expected at the Sixtieth Annual Meeting in Montreal, September 14-17, are in the hands of these committees.

Aime Cousineau, City Sanitary Engineer, is acting as Secretary of the Local Committee on Arrangements.

WESTERN BRANCH A. P. H. A.

AT the forthcoming Western Branch A. P. H. A. meeting in Seattle, May 28-30, Dr. John A. Ferrell and Dr. Kendall Emerson will represent the Executive Board of the A. P. H. A. Professor Ira V. Hiscock will also be in attendance, representing the Committee on Administrative Practice.

Dr. William C. Hassler, President-elect of the A. P. H. A., is President of the Western Branch.

NEW MEMBERS

Health Officers Section

Homer M. Austin, M.D., Columbus, O., Chief, Division of Hygiene, State Dept. of Health
Edmour Frenette, M.D., New Carlisle, P. Que., Health Officer
William B. Harrison, M.D., Memphis, Tenn., Associate Director, Local Organization, State Health Dept.
T. Douglas Kendrick, M.B., Gravelbourg, Sask., District Health Officer
Ernest A. LeBien, McHenry, N. D., Supt., Board of Health, Foster County
George J. Marbach, University City, Mo., Acting Supervisor of Sanitation
John W. McIntosh, M.B., Vancouver, B. C., Medical Officer of Health
Lloyd Moffitt, M.D., Yakima, Wash., City and County Health Officer
Dr. Eugene Mondor, Mt. Laurier, P. Que., Health Officer
E. K. Musson, M.D., Eldon, Mo., County Health Officer
M. B. Owens, M.D., Newport, Ark., Medical Director, Jackson County Health Unit
Lorenzo L. Parks, M.D., Hamilton, Ala., County Health Officer

L. A. Pequegnat, M.B., Toronto, Ont., Deputy Medical Officer of Health
Thomas E. Tucker, M.D., Monroeville, Ala., County Health Officer
Charles Williams, M.D., Montreal, P. Que., with Dept. of Public Health, McGill University

Laboratory Section

Lois Frayser, A.B., Richmond, Va., Assistant Chemist, Filtration Plant
Nell P. Hall, Springfield, Ill., Junior Bacteriologist, State Dept. of Public Health Lab.
Camille Lherisson, M.D. (Temporarily in Boston, Mass.), Prof. of Biology, School of Med., Haiti
James M. Sherman, Ph.D., Ithaca, N. Y., Professor of Bacteriology, Cornell University
William H. Swartzendruber, B.A., Iowa City, Ia., Bacteriologist, State Hyg. Labs.

Vital Statistics Section

Marjorie E. Gooch, M.S., Baltimore, Md., Statistician, Rural Survey, A. P. H. A.
Louis Weiner, E.E., New York, N. Y., Vital Statistician, Dept. of Health

Public Health Engineering Section

Victor Greiff, E.E., New York, N. Y., Disposal Division, Sanitation Dept.
 Charles H. B. Hotchkiss, M.E., New York, N. Y., Editor, Heating & Ventilating
 Augusta E. Jay, New York, N. Y., Assistant Editor, American Journal of Public Health
 Aubrey H. Perry, B.A.Sc., St. Catharines, Ont., Asst. Engr., Dept. of Natl. Health

Industrial Hygiene Section

Alexander R. Pennoyer, M.D., Montreal, P. Que., Medical Adviser, Bell Telephone Co.

Food, Drugs & Nutrition Section

Clayton P. Osgood, B.S., Augusta, Me., Milk & Dairy Inspector
 Max Paun, Detroit, Mich., Physical Education
 Rolland E. Spaun, Lansing, Mich., Bacteriologist, State Dept. of Agr.

Public Health Education Section

Estella S. Edson, R.N., Sacramento, Calif., Executive Secretary, Sacramento Tuberculosis Assn.
 Wilbur A. Heinz, A.B., Lexington, Ky., Instructor in Hygiene and Public Health, University of Kentucky
 Jean V. Latimer, B.S., M.A., Boston, Mass., Educational Secretary, Mass. Tuberculosis League
 Robert W. Osborn, Buffalo, N. Y., Executive Secretary, Buffalo Tuberculosis Assn.
 Ivan K. M. Scheepers, Johannesburg, S. Africa, Secretary, S. African Red Cross Society (Assoc)
 Savel Zimand, New York, N. Y., Administrative Director, Bellevue-Yorkville Health Demonstration

Public Health Nursing Section

Belle L. Barnstead, R.N., Hillsdale, Mich., County Nurse
 Naomi B. Blouin, R.N., Livingston, Tenn., Tri-County Public Health Nurse
 Jean M. Campbell, Austin, Tex., Field Nurse
 Ada B. Coffey, R.N., Albany, N. Y., Extension Secretary, Public Health Nursing, State Dept. of Health

Helen J. Lapham, R.N., Millerton, Okla., U. S. Indian Service Field Nurse
 Ernestine Schwab, San Francisco, Calif., Public Health Nurse, Dept. of Health
 Matilda A. Wade, R.N., Wellsburg, W. Va., Public Health Nurse

Epidemiology Section

Robert E. Hickey, M.D., Milwaukee, Wis., Director, Bureau of Communicable Disease
 Daniel F. Milam, M.D., Nashville, Tenn., Epidemiologist, State Dept. of Public Health

Unaffiliated

George Boehr, M.D., New York, N. Y., Member, Executive Comm., Committee on Public Health Relations, N. Y. Academy of Medicine
 A. H. Burkholder, Quarryville, Pa. (Assoc.)
 Joseph M. Callner, Chicago, Ill., Chairman, Public Linen Supply Assn. of America (Assoc.)

DECEASED MEMBERS

Charles J. Hastings, M.D., Toronto, Ont., Elected Member 1911, Fellow 1922, Honorary Fellow 1926
 L. C. Bulkley, St. Paul, Minn., Elected Member 1919, Fellow 1923
 Henry B. Hemenway, M.D., Springfield, Ill., Elected Member 1918, Fellow 1922
 Charles Krumwiede, Jr., M.D., Bronxville, N. Y., Elected Member 1918, Fellow 1922
 Lyman M. Ellis, M.D., Kensington, Ill., Elected Member 1919
 J. L. Ludlow, Winston-Salem, N. C., Elected Member 1903
 W. T. McArthur, M.D., Los Angeles, Cal., Elected Member 1920
 M. G. Schlotbom, M.D., Pittsburgh, Pa., Elected Member 1919
 G. C. Stevenson, M.D., Youngstown, O., Elected Member 1907
 Nathan Straus, New York, N. Y., Elected Member 1903
 Paul Preble, M.D., Ancon, C. Z., Elected Member 1923
 Arthur O. Bauss, New York, N. Y., Elected Member 1921

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Health Program for New York State—On February 16, the Special Health Commission, appointed on May 1, 1930, by the Honorable Franklin D. Roosevelt, Governor of New York, submitted its preliminary report in which it declares that the pressing immediate needs for the commonwealth are: (1) effective local health departments with qualified personnel; (2) more effective service in the control of tuberculosis, cancer and the venereal diseases; (3) more comprehensive measures to reduce infant deaths and deaths among mothers from causes incident to childbirth; (4) further coördination of school hygiene with other health service; (5) better organization for the discovery and cure, rehabilitation and care of crippled children; (6) the extension of public health nursing throughout the state to reach the standards now in effect in a few areas; (7) protection of the public health through additional safeguards in the purification of water supplies and the prevention of stream pollution; (8) more attention to the growing problem of industrial hygiene.

The Commission includes first among its major recommendations that there be created county boards of health to provide for the rural areas and villages, and that in areas with a population of more than 50,000 the health officer must devote his entire time to the duties of his office. It is recommended that there be established three additional state tuberculosis sanatoriums, primarily to receive patients from counties which are too small in population and wealth to maintain suitable sanatoriums. The cost of maintaining patients in such institutions should be

met by the counties. It is also suggested that the State Sanatorium at Ray Brook be placed under the direction of the Department of Health. Further, a division of cancer control for the State Health Department is recommended. Other major recommendations provide for a more adequate diagnosis and treatment of venereal diseases, together with protection for the health of mothers and children, public health nursing service in rural areas, coördination of facilities for the care of crippled children, extension of industrial hygiene service, approval of plans for public water supply, and elimination of stream pollution by industrial wastes. It is recommended that the present authority of the Public Health Council to establish qualifications for certain public health personnel be extended to include other positions in the public health field.—Preliminary report of the Governor's Special Health Commission, New York State Dept. of Health, Feb. 19, 1931.

Smallpox in Williamstown—Dr. George H. Bigelow, Commissioner of Public Health for Massachusetts, reports that in a recent outbreak of smallpox which occurred in Williamstown, there resulted 9 secondary cases among 9 unvaccinated exposures. At the same time there were exposed 38 vaccinated individuals, none of whom contracted smallpox.

The first case occurred in the person of V. His wife who had been vaccinated escaped, but the baby, unvaccinated, succumbed. Mrs. V. and the baby had just recovered from chickenpox. V. visited a home in Williams-

town where he had close personal contact with 6 individuals, 5 of whom had never been vaccinated. The sixth individual, who was vaccinated, did not develop smallpox while all of the five unvaccinated became ill.

V. attended a dance in Williamstown at which 35 individuals were present. All save 1 were vaccinated. This 1 developed smallpox while the other 34 escaped the disease.

V. also visited a home in Bennington, Vt., where he had intimate contact with 4 individuals, 2 of whom were unvaccinated and developed smallpox. The 2 who had been vaccinated did not become ill.—*Special Report*, Massachusetts State Health Dept., Mar., 1931.

Typhoid Carriers in Denmark—The State Serum Institute at Copenhagen serves as the central epidemiological laboratory for the entire country and, with the cooperation of the local health boards, receives reports on all new cases of typhoid fever and pays particular heed to the carrier state. A registration system has been established for cases and carriers. There is no absolute guarantee that an individual who has recovered from typhoid fever may not be discharging typhoid fever

bacilli, even though previous examinations have shown their absence. Furthermore, the demonstration of a common source of infection will often be facilitated by the knowledge of all typhoid fever cases in the district.

All chronic carriers, that is, those in which the bacilli are demonstrated more than 1 year after the onset of the disease, are placed under strict surveillance of the health board. All patients who are still discharging typhoid fever bacilli 3 months after the onset of the disease are carried as "observation carriers." All information concerning cases and carriers is entered in a tickler file and classified as a new case, observation carrier, or chronic carrier. The State Epidemic Service finds this an extremely valuable method of curtailing the spread of typhoid fever through temporary or chronic carriers. A card index system provides accurate knowledge of the distribution of typhoid fever in Denmark; gives adequate control over the patient who is under the supervision of the Board of Health until the stools are found free from typhoid fever bacilli; and improves the accuracy of the typhoid fever statistics.—P. H. Andresen, State Serum Institute, Copenhagen, Denmark.

LABORATORY

JOHN F. NORTON, PH.D.

A LOW-TEMPERATURE INCUBATOR

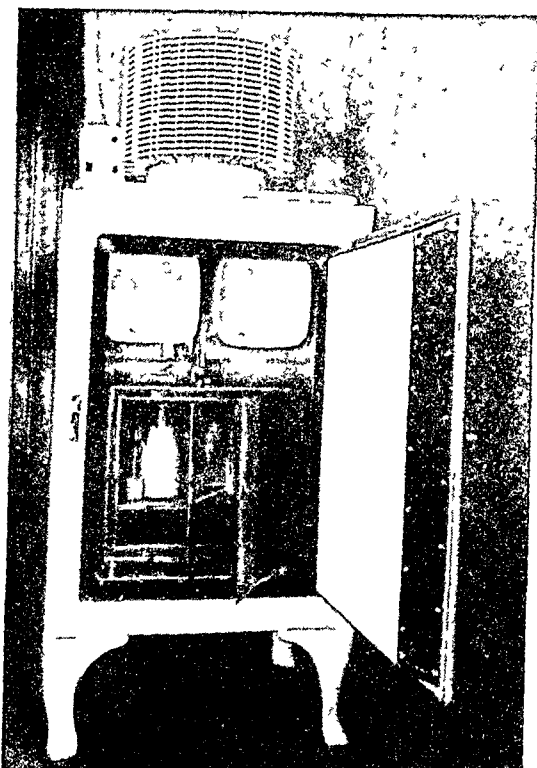
DAVID B. CHARLTON

Department of Bacteriology, Oregon State College, Corvallis, Ore.

CONTROLLED incubation at levels below room temperature is required in several types of scientific work. The low-temperature incubators in use are of the water circulating type, with an ice chamber and water-jacketed working compartment. This type is useful in water control laboratories for incubation at 20° C. for gelatine culture work, and for operating at temperatures ranging from 10° C. to 25° C. or above. Recently a new type using electrical refrigeration has been developed.

The accompanying illustration shows a model which possesses several significant advantages. It was desired to have an incubator with which temperatures of 5° C. or lower could be maintained. A commercial type electrical refrigerator with a double cooling unit was used. A removable water-jacketed copper incubator was constructed to allow an air space of approximately 2" on all sides. The refrigerator has a device for approximate regulation of the temperature. This is adjusted for a temperature below that required. By means of an electric heating element on the bottom of the copper incubator and a thermo-regulator, the desired inside temperature can be maintained. The thermostat is of the rod expansion type and is regulated by means of a milled screw head from the outside on top of the incubator. A pilot lamp indicates when contact is made or broken.

The working compartment is provided with a cushioned glass door to allow inspection of the contents of the incubator without exposure to the warmer air of the room.



The one shown here has inside dimensions of 12" x 15" x 14". It has a temperature range from below 0° C. to 25° C. with a sensitivity of $\pm \frac{1}{2}^{\circ}$ C. A model with a single cooling unit would very likely be satisfactory if temperatures not lower than 10° C. were required. This model has proved satis-

factory during the past year in bacteriological work in minimal growth temperature determinations.

An important feature is that when low temperature incubation is not required, the copper incubator can be removed and the refrigerator and incubator used for their respective purposes. In regard to cost of maintenance, convenience, and automatic operation, it

possesses all the advantages of modern electrical refrigeration over the old ice-box.

The copper incubator was built and installed by J. O. Halverson of the National Appliance Company, Portland, Ore. The electrical details are not presented here as they would vary with the size of the refrigerator and type of low temperature incubation required.

RAPID AGGLUTINATION IN TULAREMIA TESTS

HERBERT E. MCDANIELS

Senior Bacteriologist, Division of Laboratories, Illinois Department of Public Health, Springfield, Ill.

THE ready agglutination of *B. tularensis* in the presence of positive serum has been noted by many workers. Hull¹ has described a rapid slide agglutination test employing a heavy bacterial suspension similar to that used by Huddleson and Abell² in their drop agglutination test for the detection of *Br. abortus* agglutinins. The importance of shaking in bringing about bacterial agglutination has been emphasized by Noble.³

In this laboratory it has been found that adequate shaking of the tubes in the ordinary routine tularemia test enables us to render a final report within about 3 minutes after setting up the test. A standard Kahn rack and tubes, or any test tube rack and tubes which will permit vigorous shaking, are suitable. The test is set up in the usual manner; it consists of a row of 8 tubes containing 0.5 c.c. each of serum dilutions ranging from 1:10 through 1:1,280, each succeeding tube having half the serum concentration of the pre-

ceding one. To each tube and a control containing 0.5 c.c. saline, 0.5 c.c. of formalin-killed antigen of a turbidity ordinarily used in macroscopic agglutination tests (BaSO₄, No. 2-No. 4) is added. The rack is held in both hands and shaken for 2 minutes as in the Kahn⁴ test, and then gently for a minute longer.

We have found this procedure gives clumps of bacteria easily visible to the naked eye and in as high dilutions as can be brought out by 2 hours in the water-bath followed by overnight storage in the ice-chest. It requires no special antigen or apparatus and considerably expedites the reporting of results. It is also applicable to other agglutination reactions, but works especially well with *B. tularensis*.

REFERENCES

1. Hull, Thomas G. *A. J. P. H.*, 19, 423-424, 1929.
2. Huddleson, I. F., and Abell, E. J. *Infect. Dis.*, 42, 242-247, 1928.
3. Noble, A. J. *Bact.*, 14, 287-300, 1927.
4. Kahn, R. L. *The Kahn Test—A Practical Guide*, 1928, pp. 113-115.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Vital Statistics in Australia—At the end of 1929 the population of Australia reached the total of 6,414,372. The rate of growth during 1929 was 1.22 per cent and for 10 years 19.2 per cent, which is probably the highest rate of increase in the world. Excess of births over deaths contributed 70.5 per cent of the total increase, and net immigration 29.5 per cent. The density of population of Australia is only 2.16 persons per square mile, and varies from 1 person per 100 square miles in the Northern Territory to 20.22 persons per square mile in Victoria.

The birth rate for 1929, 20.31 per 1,000 of population, was the lowest ever recorded. Compared with many other countries the Australian rate is low, but it is fortunately accompanied by a low death rate, giving a rate of natural increase that is equaled in few countries. Extranuptial births numbered 4.70 per cent of all births registered. The proportion of multiple births is one case of twins in every 98 confinements and one of triplets in 14,242 confinements. The average number of children per mother was 2.96, against 2.99 in 1928.

During the year, 60,857 deaths were registered, corresponding to a rate of 9.55 per 1,000 of the population. This rate was slightly above the average of the previous 5 years but nevertheless compares most favorably with other countries. The principal causes of death were: heart diseases, 15.3 per cent; cancer, 10.3 per cent; violence, 6.0 per cent; cerebral hemorrhage, 5.8 per cent; tuberculosis, 5.7 per cent; nephritis, 5.6 per cent; pneumonia, 4.9 per cent. The number of deaths in

childbirth was 5.1 per 1,000 children born. The infant mortality rate for Australia (deaths of children under the age of 12 months) per 1,000 children born was 51. This rate is the lowest ever recorded in Australia and is, with the exception of New Zealand, the lowest in the world. The rate for New Zealand is 34.—*J. A. M. A.*, 96: 878 (Mar. 14), 1931.

Health Conditions in the Pacific Islands—The report of the mission entrusted with a survey of health conditions in the Pacific Islands, published by the League of Nations Health Organization, is a study of the causes of depopulation in Melanesia the correction of which will, it is hoped, provide means for the control of health in Melanesia.

According to this study Asiatic and Indian immigration was found to have a considerable influence on the disease picture. The distribution of amebic dysentery appears to coincide almost exactly with the distribution of Asiatic population. During the last 5 years Indo-Chinese labor has been introduced into the New Hebrides. A total of some 5,000 persons has been introduced and this number is increasing. Problems similar to those existing in New Caledonia and Fiji will presumably arise. In Fiji, where the Indian population is now fixed, immigration is small and indenture has ceased.

Frambesia is almost universal in Melanesia in the coastal areas. The absence of syphilis among natives and the relationship between frambesia and syphilis are important considerations in

southern Melanesia on account of Asiatic immigration. The indigenous hookworm throughout the whole of Melanesia is *Necator americanus*. It is extremely widespread but appears to be of little significance or importance in actual hospital statistics. It probably acts by reducing the resistance to other diseases. In most areas it is possible to cope with the situation by occasional mass treatment.

These conditions do not obtain when the causative organism is *Ancylostoma duodenale*. This organism is associated with Asiatic immigration. Its virulence is much more pronounced than that of *Necator*, it is much harder to expel, and it is not affected to the same degree as *Necator* by carbon tetrachloride. Filariasis is almost universal in Melanesia. It is a potent factor in economic loss. Elephantiasis, apart from the disfigurement that it causes, cripples a definite proportion of the natives and may have a minor effect on population.

It is only recently that attention has been devoted to myositis in the Pacific as a specific entity related to filariasis. The proportion of persons affected varies greatly from place to place, from 100 per cent to complete absence.

Malaria is present in northern but absent in southern Melanesia. The possibility of its introduction into Fiji or New Caledonia calls for serious consideration. Syphilis is virtually non-existent except as a possibility of the future. On the other hand, gonorrhea is fairly common. The type of the infection is unusual in that it produces few complications and the question has been raised in some localities as to whether the disease is actually gonorrhea.

Bacillary dysentery is not the scourge that it formerly was. Tuberculosis is regarded as the most important feature in the problem of depopulation in certain of the administrations in Melanesia.

As a result of the examination of the

bodies of native laborers dying at Rabaul, it has been found that 24 per cent of all indentured laborers die of tuberculosis and that pneumococcal infection accounts for an equivalent number. In other words, half the total deaths of laborers are due to pneumonia or tuberculosis.

Typhoid has not been seen in the British Solomon Islands Protectorate. It is extremely rare in Papua. It is becoming increasingly frequent in Rabaul and is engaging the serious attention of the administration. In Fiji and in New Caledonia it is a matter of the greatest importance. Measles is said to have destroyed one-third of the population of Fiji in 1874-1875 and in a second epidemic years later destroyed thousands of people, but it occurs at present without any virulent symptoms. Diphtheria is beginning to assume the characters seen in civilized countries. Scarlet fever does not seem to occur.

Students of the depopulation of Melanesia have suggested numerous causes, among them the heavy infantile mortality rate, the mortality rate at all ages from preventable disease, and the fact that the great majority of natives alternate between periods of plenty and periods of actual starvation. Medical problems of Melanesia are complicated by the low state of civilization, the belief in sorcery and the scattered nature and the smallness of the native communities.

After various experiments a central medical school was established at Fiji for the training of 40 students. The Rockefeller Foundation agreed to contribute to this a diminishing proportion of the total expenditure for 4 years.

In the matter of infant mortality it is the ignorance of the village mother that is of primary importance. The question of abortion and infanticide is a problem.

Where polygamy was the rule, certain antisocial practices have grown up since

substitution of monogamy as a result of the influence of missionaries. In some tribes a woman is deserted by her husband if she becomes pregnant, because there is no other wife to carry out her domestic and agricultural duties. For the same reason a woman sometimes continues to work until she is in an advanced stage of pregnancy. Abortion is frequent from this cause and no premature infant survives among native people.

In regard to infanticide, Melanesians have for generations terminated pregnancy by the use of many plants, most of which owe any potency they possess to the presence of tannic acid; or by mechanical means, such as the prolonged pounding of the pregnant uterus through the abdominal wall. It was found that 18 mothers died in every 1,000 births; in some areas this figure was as high as 65.

Even when children are successfully born, they have to face many hazards, such as faulty feeding, early weaning, neglect and malaria. However, the activities for the care of pregnant women, for the feeding of infants, and for the safeguarding of children up to the age of puberty represent the most direct attack on the problem of depopulation observed by the mission.—*J. A. M. A.*, 96: 788–790 (Mar. 7), 1931.

Tripping and Falling Accidents—Since 1923 organized effort to get workers to work safely in New York State has been active and continuous, but the number of compensated accidents from all causes increased 72.9 per cent. There was an important exception to this general increase. During the same period, casualties due to mechanical causes decreased from 25 per cent of the total from all causes to 15 per cent in spite of the vastly increased use of machinery. This notable result was achieved only because of the force-

ful insistence by the State Labor Department and insurance companies that mechanical hazards had to be removed.

Tripping and falling accidents are almost invariably caused by some unsafe condition. In Greater New York, nearly twice as many people are killed by falls as by typhoid and scarlet fevers, chicken pox, measles, diphtheria and croup, all combined, and twelve times as many as by fires. In Continental United States, according to the U. S. Bureau of Vital Statistics, over 17,000 people were killed by falls last year. Every 10 years more of our people are killed by falls than our total army and navy losses in battle in all our wars since the Revolutionary War, not excluding the World War.

With over 17,000 fatalities from falls per year, 70 compensable cases for each fatality, and a cost of \$410 per case—the average in New York State last year—our direct national cost for falls is over \$487,900,000. Last year it cost every man, woman and child in New York State more than \$1 to pay the compensation costs for the falls in only the industries under the jurisdiction of the State Labor Department. Falls in New York State industries last year placed 288 workers beyond the aid of any employment bureau by reason of deaths or permanent disability. In addition, 19,197 workers were placed on the unemployment list for a total of 621,346 weeks or an average of 52 weeks each. According to statistics for New York State, in total cost, total amount of lost time, and severity of non-fatal injuries, falls rank first of industrial injuries. In 1926, 1927, and 1928 they also caused the greatest number of fatal accidents.

Of the 1,088 persons killed by falls in Greater New York City in 1929, there were 12 from ladders, 32 from scaffolds, and 41 in building construction. There were 545, or slightly over one-half the total, on stairs, floors and

street. In the industries of the state, stairs, steps and level surfaces accounted for 63.8 per cent of the falls, 38.8 per cent of the lost time from falls, and 41 per cent of the compensation paid for falls. Slipping of foot, slipping or loss of balance, stumbling, misstepping or heel-catching, defective or broken surfaces, are the terms used to describe the chief causes of this largest group of falls which cost the people of this state \$3,226,190 last year. Unsafe conditions stick out all over this group. Ladders, scaffolds and staging were responsible for 17.1 per cent of the falls, 27.3 per cent of the lost time from falls, and 28.2 per cent of the compensation paid for falls. Falls from miscellaneous elevations, such as benches, boxes, structures in construction and demolition, roofs, window and wall openings, loading platforms, balconies, etc., caused 14.8 per cent of the casualties from falls, 27 per cent of the lost time from falls, and 25 per cent of the compensation from falls. Falls into excavations, pits, and openings cause 3.3 per cent of the falls, 5.8 per cent of the lost time from falls, and 4.8 per cent of the compensation paid for falls.

The most careful analysis of the various groups into which falls are classified, and over 20 years' experience in combating this type of accident indicate that unsafe conditions instead of unsafe practices by the worker are the underlying causes of nearly all falls.—H. W. Mowery, *Safety Eng.*, Jan., 1931, p. 12.

Deaths from New York Street Accidents Decrease—New York City, for the year 1930, shows the largest decrease in deaths from street accidents for any year since 1923. According to summaries compiled by the Police Department Safety Bureau and made public by Police Commissioner Edward P. Mulrooney, the total number of children killed in street accidents decreased

similarly, but the fatalities due to playing in the roadways increased from 116 in 1929 to 137 in 1930, indicating that city streets are less than ever a desirable substitute for playgrounds.

The total number of street deaths in 1929 was 1,332, while in 1930 it was 1,260, a decrease of 72. Non-fatal accidents increased from 53,450 in 1929, to 54,495 in 1930, but this increase was the smallest recorded in any year since 1923. Of these totals, the deaths of children (16 years and under) were 992 in 1929, and 939 in 1930, while for injuries only the respective figures are 39,862 and 40,819. The chief single cause of accidents continues to be "jay-walking," although this shows a decrease of 91 fatalities. Crossing the street against traffic lights, however, caused 51 more fatalities and 140 more injuries than in 1929. Reckless driving, likewise, has caused a slight increase in deaths and injuries, while collisions showed a remarkable decrease.—*Am. City*, 44: 169 (Feb.), 1931.

Infant Mortality in Porto Rico—The infant mortality rate for Porto Rico during the fiscal year 1927–1928 was 146 per 1,000 live births. During the 5-year period ending in 1928, the rate averaged 148. The highest rates were recorded in the coast towns, especially those of the west coast, and in the urban centers where the density of population is greatest. During the last 5 years the percentage of infant mortality in the west coast towns was 205; of the southern coast 164; of the northern coast 153; and of the east coast 150. In the central towns, the average was 116. Infant mortality in Porto Rico is in direct proportion to the density of population, being much greater in the urban centers than in the rural areas. The fact that infant mortality varies as to race, being higher in the negro race than in the white, partly explains the high coastal rates, since the colored popula-

tion is much less numerous in the interior than on the coast. In 1928-1929 the rate among the negroes of Porto Rico was 205 against 175 for the white population.

A factor in the high mortality of infants in Porto Rico is to be found in the loose regard in which the marriage ceremony is held in the island. Illegitimacy, as a consequence, is high, and since the mortality of infants of this class is considerably above that of legitimate children, a high rate of mortality is inevitable. In 1927-1928, the infant mortality of legitimate children in Porto Rico was 122; among illegitimate children it was 246. However, there are certain types of illegitimate children, born to parents not legally married but living together permanently, whose environment is not dissimilar to that of children born in wedlock. This explains the fact that certain places, having high rates of illegitimacy, have low rates of infant mortality; as happens in Villalba, with 27 per cent of illegitimate children, in Aibonito with 29 per cent and in Comerio and Utuado, with 25 and 28 per cent respectively. On the other hand, Santa Isabel, with 48 per cent of illegitimate children, had in 1926 and 1927 the highest infant mortality—272—in the Island, during the last 5 years.

Other factors of the Porto Rican infant death rate are indicated by an analysis of the chief causes of deaths. Prenatal, natal, and neonatal causes are relatively unimportant compared with those due to digestive disorders, diseases of the respiratory system and the communicable diseases. For example, in New York in 1924 the deaths under 1 month of age constituted 58 per cent of the total infant deaths under 1 year; while in Porto Rico they comprised but 29 per cent.

The utter ignorance of child hygiene is reflected in the fact that during the 5-year period 1923-1928, out of every 1,000 live births there were 49 deaths due to digestive diseases; 28 to respiratory diseases and 21 to communicable diseases. Of the diseases of the digestive system, diarrhea and enteritis caused 94 per cent of the deaths. The most important factor in the etiology of respiratory affections was direct contagion from older persons suffering from bronchitis and influenza. The chief diseases of the communicable group responsible for infant mortality in Porto Rico are malaria and tetanus. These two diseases caused 63 per cent of the total deaths attributable to this group. Malaria is much more common in the coast towns than in the interior. It has been estimated that not more than 6 per cent of the population of the inland towns is infected with the malaria parasite, while on the coast the average is from 25 to 35 per cent. Tetanus is, geographically, irregularly distributed.

Among the diseases of early infancy, congenital debility holds first place, having caused 86 per cent of the infant deaths in this group of diseases in 1927-1928. It is thought likely that many deaths charged to congenital debility are in reality chargeable to syphilis inherited from luetic parents. Out of 2,395 applicants for health certificates examined by the local health office of San Juan, in one year 242 or 10 per cent reacted positively to the Wassermann test. This proportion is high enough to lead to the conclusion that the infant death rate from congenital syphilis is greater than statistics indicate.—A. Fernos Iseru and J. Rodriguez Pastor, *A Survey of Infant Mortality in Porto Rico, Porto Rico Pub. Health & Med.*, VI: 151-154 (Dec.), 1930.

street. In the industries of the state, stairs, steps and level surfaces accounted for 63.8 per cent of the falls, 38.8 per cent of the lost time from falls, and 41 per cent of the compensation paid for falls. Slipping of foot, slipping or loss of balance, stumbling, misstepping or heel-catching, defective or broken surfaces, are the terms used to describe the chief causes of this largest group of falls which cost the people of this state \$3,226,190 last year. Unsafe conditions stick out all over this group. Ladders, scaffolds and staging were responsible for 17.1 per cent of the falls, 27.3 per cent of the lost time from falls, and 28.2 per cent of the compensation paid for falls. Falls from miscellaneous elevations, such as benches, boxes, structures in construction and demolition, roofs, window and wall openings, loading platforms, balconies, etc., caused 14.8 per cent of the casualties from falls, 27 per cent of the lost time from falls, and 25 per cent of the compensation from falls. Falls into excavations, pits, and openings cause 3.3 per cent of the falls, 5.8 per cent of the lost time from falls, and 4.8 per cent of the compensation paid for falls.

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PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

Bay Disposal and Chlorination at Newport Beach, Calif.—The separate sewer system at Newport Beach, Calif., which provides for the sand spit lying between the bay and the ocean, is discussed. The sewage was treated in an Imhoff tank and the effluent discharged into the tidal portion of the Santa Ana River. As a result of numerous complaints of objectionable odors experiments were carried out on chlorination for odor control.

A brief description is given of the field experiments and the results of pre-chlorination. A chlorine dose of 10–12 p.p.m. proved to be sufficient to control the odors and the chlorine demand was reduced considerably by improvements made in the Imhoff tank.

The effluent is now discharged into the bay without further treatment but the development of the district in the vicinity of the Imhoff tank and the increased use of the bay for bathing are beginning to necessitate further treatment of the sewage.

Figures showing the average amount of hydrogen sulphide at various points of the sewer system and the results and costs of chlorination are included.—R. L. Patterson, *Sewage Works J.*, 1930, 2, 111. From *Summary of Current Literature*, Dept. of Sci. & Indust. Res., III, 12 (Dec.), 1930.

The River as a Clarification Plant—The physical and biological effects of a river on sewage are briefly described. The amount of sewage which a river can carry without being overloaded depends on the relation of the biochemical oxygen demand of the sewage to the amount of oxygen in the river or avail-

able by diffusion from the river surface or from green plants. An equation is given from which the effect of a sewage load on a stream under normal conditions may be estimated. Solid matter affects the stream only over a short distance though its effect may be very serious. Dissolved matter may be carried undecomposed for considerable distances.

Temperature plays a great part in determining the self-purifying power of a stream. Decomposition proceeds more slowly at low temperatures than at higher temperatures. At temperatures above 20° C. it may, however, be necessary to diminish the load on the stream in order that decomposition may not proceed too rapidly for the amount of oxygen available.

The practical application of the conditions of self-purification in a stream to the problem of the necessary treatment of sewage is discussed. When treatment is necessary, a satisfactory removal of sludge is the most important point. Dams on a river improve the self-purifying power by retaining sludge and by giving more time for the decomposition of organic matter. It is essential, in considering the use to be made of a river, to treat the river as a whole.—Mahr (Address delivered before a meeting of the chief technical officials of German cities in Leipzig on Sept. 3, 1930). From *Summary of Current Literature*, Dept. of Sci. & Indust. Res., III, 12 (Dec.), 1930.

Demonstrating Proposed Treatment by Means of Miniature Plant—The water supply of Morgantown, W. Va., which is obtained from impounded

mountain and Monongahela River water, is discussed. The mountain water, which is chlorinated at the impounding reservoir, has a hardness content of approximately 15 p.p.m., and is of excellent quality. The river water, however, which is treated with lime and alum and filtered through rapid sand filters, is heavily polluted with acid mine waste water and sewage and has a hardness content frequently exceeding 300 p.p.m.

The contrast between the two waters gave rise to complaints. A report was therefore made on the possible solutions of the problem and a miniature plant, a brief description and photograph of which are given, was installed to demonstrate the various methods of treatment. Filtration of the mountain supply and zeolite softening of the river supply were recommended as the most feasible solution of the problem.—L. V. Carpenter, *Water Works Eng.*, 83: 351, 1930. From *Summary of Current Literature*, Dept. of Sci. & Indust. Res., IV, 1 (Jan.), 1931.

Lake Clusters Reveal a Florida Ground Water Supply—The appearance of salt in the well water supply of St. Petersburg, Fla., led to a survey of the geological conditions of the state, which is entirely underlain with limestone.

Peculiar conditions are caused by the formation of solution passages, sink-holes and basins in the limestone. The solution passages discharge into the Atlantic or the Gulf of Mexico. To maintain a fresh water flow toward the sea, the ground water level must be high enough to equalize, in spite of friction loss in the solution passage, the pressure of the depth of heavier sea water above the outlet level.

The causes which contributed to the reduction of the fresh water head and the consequent salting of the St. Petersburg supply and the experiences of

other communities are described. The author deals with the choice of a new source of supply for St. Petersburg in the Cosme-Odessa lake region and the precautions to be taken to control hydrostatic conditions.—M. Pirnie, *Eng. News-Rec.*, 105: 402, 1930. From *Summary of Current Literature*, Dept. of Sci. & Indust. Res., IV, 1 (Jan.), 1931.

Filter for the Purification of Water—A steam generator is built in the pipe line supplying water to the filter employed for treatment of the water. Steam from the generator, which may be supplied with water from the pipe line, is used to sterilize the filter, and the condensed water produced during sterilization can run back automatically to the generator. Illustrations of the apparatus are included.—J. Muchka, Austrian P., 118, 362; *Chem. Zentralbl.*, 2: 1749, 1930. From *Summary of Current Literature*, Dept. of Sci. & Indust. Res., IV, 1 (Jan.), 1931.

Port Sanitation—The duties of a port sanitary authority are manifold and the duties of the Port Sanitary Authority at Plymouth, England, are given as an example. The sanitary inspection of ships in dock with reference to the comfort of the crew is a regular duty. The regulation of food comes under the Authority, including both imported food and that produced locally, such as oysters. The pollution of waters by chemicals and oils is studied and methods evolved for its elimination. Medical inspection of aliens is a problem requiring considerable study and close attention, as between 16,000 and 17,000 aliens arrive during the year.

The most important branch of the Authority's duties is the control of infectious diseases. Being a port of entry only 4 days from South America, 8 days from Lagos and 1 week from India—periods well within the incubation periods of yellow fever, cholera,

smallpox and plague—the prevention of introduction of these diseases is a matter of no small importance.

The inauguration of air travel has tremendous possibilities in the way of introducing diseases and quarantine stations or a bill of health from the starting port is mentioned as means to control this channel of entry.—P. B. P. Mellows, *J. Roy. San. Inst.*, 50, 11: 712–716 (May), 1930. From *Public Health Eng. Abstr.*, X, PHA, 9 (June 14), 1930. Abstr. H. A. Johnson.

On the Influence of the Wind in the Spread of Anopheles Maculipennis—Medemblik, Holland, is situated on a slip of land projecting into the Zuider-Zee in such a way that it is inclosed by sea with the exception of a sector of 90°. In studying antilarval work, it was believed sufficient to limit this activity to 3 km. around the protected area, but in this plan no allowance was made for the wind as a factor in the spread of the mosquitoes. Experiments with stained mosquitoes undertaken to prove that the presence of the remaining anopheles in the protected area was due to an invasion from uncontrolled regions indicated an influence of the wind. The observations seem to show that anopheles are carried much farther than their need of food requires; right up to the center of the area, where a dense human and animal population stops them.

Daily catches of anopheles in the center of the protected area produced about three times as many mosquitoes on days following a wind passing over the uncontrolled breeding areas than on other days when there were only sea winds.—N. H. Swellengrebel, *Am. J. Hyg.*, 10, 2: 419–434 (Sept.), 1929. From *Pub. Health Eng. Abstr.*, X, Ma, 18 (June 28), 1930. Abstr. Arthur P. Miller.

A Rat Flea Survey of the Madras Presidency—To determine the com-

parative epidemiological rôle of the various species of fleas in plague transmission in Madras, India, field studies were made from September, 1928, to the end of January, 1929, in three areas: Hosur, Salem District; Western Half of the Bellary District and Guntakal of the Anantapur District; and Periakulam, Kambam Valley, and Dindigul.

The sanitary surveys contain detailed information regarding each area, with particular reference to rat infestation. Rat trapping measures were instituted; fleas removed from the rats caught and examined. One feature common to the three regions was the high proportion of the *X. cheopis* flea on the rats, *X. astia* being the second most prevalent. Another feature was the insanitary condition of the houses, affording excellent rat harborage. Some Hindus regarded rat destruction as irreligious and refused permission to place traps in their houses.—H. H. King, P. V. Seetharama Iyer, N. Natarajan and P. V. George, *Indian J. Med. Res.*, 17, 1: 297–334 (July), 1930. From *Pub. Health Eng. Abstr.*, X: 4 (June 21), 1930. Abstr. I. W. Mendelsohn.

Garbage and Refuse Collection and Disposal in Austria, Germany, France and Italy—Collection methods in Europe are more refined than in United States or Canada. Garbage and refuse are protected from exposure to air and wind. There are three systems of house storage used in Germany: (1) can for each householder; (2) large cans filled by several householders; (3) individual householder service or can exchange system. Wagons are specially built auto trucks. Receiving chutes are specially constructed so that garbage cans fit exactly so that no dust, garbage and refuse come in contact with air or are scattered.

Frankfort, Germany, 460,000 population, collects daily 980 cu. yd. of garbage. Twenty-two large and 2 small

trucks have replaced 100 horse drawn wagons, and the city furnishes 40,000 cans. The new system shows a saving of 25.6 per cent over the old system; it is financed by tax of 1.75 to 1.45 per cent on rental value of each house.

Paris disposes of garbage by incineration with by-products such as clinker cement and brick. Revenue pays all running expenses and interest on working capital.

Cologne has a modern plant and utilizes metals, makes steam, brick paving blocks, etc. Revenues cover all costs.

In Italy the Beccari system of transforming garbage into commercial fertilizer is much used. Fertilizer is sold at \$7 to \$10 per ton.—C. M. Morssen, *Eng. News-Rec.*, 104, 3: 109–111 (Jan. 16), 1930. From *Pub. Health Eng. Abstr.*, X, GR, 10 (July 12), 1930. Abstr. A. H. Wieters.

Milk Epidemics—There has been a remarkable decrease in epidemic diseases in the last generation in Denmark. This decrease is largely in the intestinal infections, especially typhoid fever. Paratyphoid and paradyseutery epidemics still occur and these are traced to milk in the majority of instances.

The greatest chance of infection of milk is in the cow shed at the place of production. Here infection may come from both the cow and man.

The diseases which may be transmitted from cow to man are tuberculosis (bovine type), febris undulans (bacillus abortus Bang), paratyphoid fever, bacillary food poisoning (e.g., by bac. enteritidis Gartner), foot-and-mouth disease, and mastitis (streptococci). Foot-and-mouth disease and paratyphoid fever (food poisoning group) are rare. Tuberculosis is of great importance. Infection with *B. abortus* (Bang) is much greater than is usually believed. In the last 2 or 3 years it occurred in greater frequency than typhoid or paratyphoid fever.

Diseases which may be transmitted from man to milk are divided into two groups: one composed of diseases of the pharynx and the respiratory tract, including diphtheria, scarlatina and angina; the other includes typhoid fever, paratyphoid, dysentery and paradyseutery, which are diseases of the intestinal tract.

A streptococcus epidemic occurring in Kolding in December, 1926, and a paratyphoid epidemic occurring in Odense in October, 1928, are described in detail in this article. Only 5 milk-borne epidemics have occurred in Denmark during the last 2 years, 1 streptococcus, 2 paradyseutery and 2 paratyphoid. This is remarkable in view of the fact that practically all milk consumed as milk is in the raw form. About 90 per cent of the milk produced in Denmark goes for the manufacture of butter. This milk is pasteurized.—Thorvald J. M. Madsen, *Pub. Health* (London), 43, 6: 168–174 (Mar.), 1930. From *Pub. Health Eng. Abstr.*, X, Mi, 23 (Aug. 19), 1930. Abstr. P. R. Carter.

Moulds Utilized to Make Sewage Sludge Inodorous—A description is given of sewage sludge treatment at Atlantic City, N. J. The sewage is settled in plain sedimentation tanks with a detention period of 30–45 minutes and the fresh solids are pumped on to sludge drying beds. The sludge, when dried sufficiently to permit shovelling, is removed, air-dried on land or under sheds and then stored in dark buildings. During storage, moulds, which are claimed to render the sludge finally inodorous although a musty odor is present during treatment, grow throughout the sludge even in winter.—C. G. Wigley, *Pub. Works*, 61: 38, 1930; *Pub. Health Eng. Abstr.*, July 26, 10, S, 80, 1930. From *Summary of Current Literature*, Dept. of Sci. & Indust. Res., IV, 1 (Jan.), 1931.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., PH. D., AND LEONARD GREENBURG,
M. D., PH. D.

A Review of the History of Silicosis on the Witwatersrand Gold-fields—The gold bearing area, where mining operations are carried on upon a large scale in silicious rock of "phthisis-producing" type, extends for some 30 miles on either side of Johannesburg, and is composed of a quartz conglomerate (silica, silicates, pyrites) with free silica in the original ore at 75–80 per cent. Dr. McCrae's classical paper on "The Ash of Silicotic Lungs," published some 16 years ago, showed that the mineral particles present were practically all under 5μ and 70 per cent were under 1μ in size.

The history naturally falls into 4 periods:

1. The initial period of gold mining on the Rand, from 1886 to 1899, that is, from the date of the first discovery of the reef until the outbreak of the South African War. One may fairly call this period, so far as local conditions are concerned, a period of ignorance of the dangers of silicosis.

- 2 The period of first realization of the menace of silicosis and of tentative preventive measures, from 1901 to 1910

3. The period of the introduction of a legal system of compensation for the disease, and of the trail of more systematic preventive measures, from 1911 to 1916.

4. And, finally, what one may call: The period of the "present-day" system of fully systematized measures of prevention, detection, and compensation, from 1916 to the present time.

As a mining field the Witwatersrand today stands unequalled as regards the scale on which operations are carried on, the depth the workings have attained, the organization involved, and the extent of the precautions taken to

prevent miners' phthisis. Visible dust underground is as rare as it once was common; exposure to fumes from blasting if occurring at all is accidental; and sustained efforts are being made to provide improved ventilation.

At the present time there are 45 mines of which 9 are small tribute companies. The number of European miners employed is over 10,000, and of underground colored employees over 147,000. The tonnage hoisted is over 36,000,000 tons per annum, practically all of which is broken by rock drills. The average stoping depth is 2,700 ft. The maximum depth attained is 7,638 ft. (Oct., 1929).

The combined operation of "dry" methods and "wet" methods of dust prevention since 1916 has resulted in an immense reduction of the quantity present by weight of dust in mine air, e.g., in 1915, 27 per cent of samples of air showed above 5 mg., which was reduced to 1.4 per cent in 1927. The "new Rand miner" is the man who has been carefully selected by physical examinations and supervised since 1916 and he now numbers 54 per cent of the whole body. Necessarily the incidence of silicosis has materially decreased, from an average of 3.5 per cent in 1917–1920 to 1.76 per cent in 1928–1929. The attack rate of silicosis among all miners from 1920 to 1923 was 5 per cent but among the "new Rand miners" in the tenth year of their service it was 1.3 per cent. During the past year silicosis was first detected among miners after 12 years' duration of exposure.

It is now urged that "wet" methods of dust allaying be replaced where possible by "dry" methods because of the apparent tendency of the former to increase the rate of tuberculosis. Other hazards confronted are high temperatures with high humidities, and the comparative ineffectiveness of water sprays to remove, from the air, particles of dust which are under $5\ \mu$ in diameter.

It is likely that the mines will continue for 20 or more years with other virgin ground possible, so that the fight against phthisis must be continued for many years, realizing, of course, that mechanical methods, replacing hand methods, may become an important factor not only in the reduction of the disease but in the reduction of the manual labor necessary.—L. G. Irvine, A. Mavrogordato, and Hans Pirow, *Internat. Silicosis Conference, Johannesburg, August 13-27, 1930* (Internat. Labour Off.), 33 pp. E. R. H.

The Measurement of Skin Temperature in Its Relation to the Sensation of Comfort—These experiments were undertaken in order "to find an objective physiological criterion for the determination of comfortable environmental conditions for human beings." In all, 4 subjects, 2 male and 2 female, were utilized in these experiments. Additional observations were made on the investigator, a female.

The apparatus employed for skin temperature determinations was of the thermoelectric type. Skin temperature observations were made on the forehead, the two cheeks, the sternum, and a point over the carotid artery. The subjective sense of comfort was classified by the subject on a basis of 1 to 5; 1 being uncomfortably cold, 5 uncomfortably warm, and 3 corresponding with the optimum condition of comfort.

The forehead temperature of the 4 subjects when they experienced conditions which they considered optimum

from the point of view of comfort ranged from 32.6 to 34.2°C . The temperature of the skin measured over the carotid artery varied from 32.2 to 34.0°C ., under like conditions. When the subject felt warm the forehead temperatures varied from 35.1 to 36.2°C ., and the temperature of the skin measured over the carotid artery varied from 35.2 to 36.2°C . On the other hand, when the subject felt uncomfortably cold, the forehead temperatures varied from 32.2 to 32.3°C ., while the carotid temperature varied from 31.2 to 31.9°C .—Emma France Ward, *Am. J. Hyg.*, XII, 1: 130-154 (July), 1930. L. G.

Transactions of the Industrial Health Section, 1930—At the Congress held in Pittsburgh, Pa., September 29-October 2, 1930, the officers of the Industrial Health Section were W. A. Sawyer, M.D., Eastman Kodak Company, Chairman, W. A. Colcord, M.D., Carnegie Steel Company, Vice-Chairman, and C. O. Sappington, M.D., National Safety Council, Secretary. L. R. Thompson, M.D., U. S. Public Health Service, was Chairman of the first two days' sessions, C.-E. A. Winslow, Dr.P.H., Yale University, of the third day's session, and Grace M. Heidel, R.N., New York Central Railroad Co., of the fourth day's session.

The papers presented and their authors were as follows:

Health Records in a Small Plant—*John H. Holzbog*

Coöperation Between Worker and Management in Health Programs—*C. O. Sappington*
Focal Infection and Its Relation to Fatigue and Industrial Accidents—*Nils Juell*

A Symposium, Qualifications of the Industrial Physician:

The Viewpoint of the Educator—*H. F. Smyth*

The Viewpoint of the Industrialist—*William G. Marshall*

The Physician-Administrator—*T. Lyle Hazlett*

The Viewpoint of the Health Department—*Albert S. Gray*

- Poisons of Industry—*William S. Wadsworth*
 Correct Feeding, Its Value to Industry—*Katherine Pritchett*
 Relation of Industrial Health to State Departments of Labor and Industry—*Elizabeth B. Bricker*
 Accidental Sickness—*Charles S. Prest*

INDUSTRIAL NURSING SECTION

- Organization and Administration of Industrial Health Units—*Glenn S. Everts*
 The Nurse in a Small Plant—*Wilhelmina A. Carver*
 Viewpoint of the Management—*Oliver G. Browne*
 Educational Program for Industrial Nurses—*Violet H. Hodgson*

A valuable discussion follows each paper.—National Safety Council, 19th Annual Safety Congress, *Special Monograph*, pp. 137-215. E. R. H.

Histopathology of Different Types of Electric Shock on Mammalian Brains—In this study sub-lethal electric shocks were administered to laboratory animals, after which the brains were removed and studied histologically. It was found that the nature of the lesion depended, to some extent at least, on the nature of the current used. The author's conclusions are as follows:

1. Electric shock when passed through the head produces lesions in the brain.
2. There is a correlation between the type of lesion and the electric wave form.
3. Heat plays but a minor rôle in the production of these lesions.
4. The intracranial vascular changes during a particular type of shock are consistent with the type of lesions produced by such shock.—

Raymond Morrison, M.D., Arthur Weeks, and Stanley Cobb, M.D., *J. Indust. Hyg.*, XII, 9 and 10 (Nov. and Dec.), 1930. L. G.

The Effects of Lead on the Vision—This contribution discusses the literature with reference to the effects of lead on vision, and presents references to 5 cases of lead poisoning with associated eye disorders, from the author's

experience. One of these cases, that of sub-hyaloid hemorrhage, is presented in some detail.

The author concludes that mere association of the two disorders, that is, lead poisoning and ocular disturbances, is no proof of casual relationship. He feels that there is no positive proof in the cases reported that lead was the agent responsible for the eye lesions.—Frank G. Pedley, M.D., *J. Indust. Hyg.*, XII, 10 (Dec.), 1930. L. G.

Rational Method for Calculating Records Obtained by Means of Owens' Jet Dust Counting Apparatus—The Owens' dust sampling instrument is a small portable type instrument having a very high efficiency for dust collecting. The present report deals with a study of the distribution of dust particles on the records with a view to ascertaining the proper technic to be employed in the making of dust counts so that they may be reported in millions of particles per c.c. of air.

In this study the distribution of particles on the cross-section of the record, as well as on the longitudinal section, and also at the dense ends of the section, has been studied. As a result of this study it is concluded that the actual length of the record need not be counted, since these are very close to 1 cm. in all cases; that the dense dust area at the ends of the strip need not be counted but instead that from 5 to 10 triangular areas of each record be counted which, by a mathematical process, may be converted over into numbers of dust particles per c.c. of air.—Dr. M. Kagan and Dr. W. Broumstein, *J. Indust. Hyg.*, XIII, 1 (Jan.), 1931.

L. G.

Report of the Medical Officer of Industrial Hygiene for the Year Ended December 31, 1929—The report of the Medical Officer of Industrial Hygiene is always an interesting docu-

ment, and the present one is no exception to this general rule. A report is presented on the examination of 500 coal miners from the viewpoint of silicosis.

During these examinations much valuable information was accumulated on the subject of miners' nystagmus. The subject of bakers' dermatitis received some attention since approximately 20 cases were encountered during the present year. The problem of the lead hazard and hygiene in the accumulative factories continues to command considerable attention. Dr. Badham recommends that no overtime be permitted in lead processes; that only persons over 18 years of age be so employed; and that a monthly medical service be inaugurated.

Other interesting activities of the bureau during the past year include studies of arsenic poisoning, spray painting, ventilation, dust in the sandstone industry, and one investigation into a newer industrial hazard, namely, the use of X-ray machines in shops or other industrial places. This last investigation indicates that there exists a very definite hazard to machine operators, owing to insufficient protection against rays leaking through the machine walls. There is little doubt that the Division of Industrial Hygiene of the Department of Public Health, New South Wales, continues to make excellent contributions to the field.—*Report of the Director-General of Public Health, New South Wales, for the Year Ended 31 December, 1929.* L. G.

Pneumoconiosis and Tuberculosis—This is a review of the whole subject of pneumoconiosis and tuberculosis in approximately 80 pages divided into 7 portions as follows: (1) An Historical Résumé of Pneumoconiosis, (2) Types of Dust, (3) Pathology, (4) Diagnosis, (5) Prognosis, (6) Relationship between Tuberculosis

and Pneumoconiosis, and (7) Prophylaxis and Treatment.

It is quite impossible in a brief abstract to do justice to the paper, since in itself it is an interpretation and very complete summary of all the important contributions in this field.

Any one who is interested in the problem of dust and its effects will find this an invaluable reference work. The paper concludes with a bibliography of 238 references.—Henry Stuart Willis, *Medicine*, 4, 4 (Dec.), 1930. L. G.

Examination of South Coast Coal Miners for Fibrous Diseases of the Lungs—The Coal Commission required medical opinion concerning the practice of stone dusting. It was therefore desirable to determine what was the present incidence and characters of fibrosis of the lungs in coal miners as a scientific safeguard against assessing all future cases of fibrosis to the practice of stone dusting.

About 500 coal miners were examined. A marked incidence of fibrous disease of the lungs was found in one pit, and already some 12 miners have been compensated for this condition, for such disease not being due to silica dust comes under the Workmen's Compensation Act of 1926. The results of this investigation will be published.—Charles Badham *et al.* Extract from the *Report of the Director-General of Public Health, New South Wales, for the Year Ended 31 December, 1929*, p. 55. E. R. H.

Bakers' Dermatitis in New South Wales in 1929—During the investigation of 20 bakers with dermatitis, it was found that the individuals were of the allergic type and sensitive to most of the chemicals and proteins met with in the course of their work.

Routine testing was carried out with wheat flours, malt wheat flour, ammonium persulphate, ammonium chlo-

ride, treacle, malt extract, dried yeast and potassium bromate. It was found that all the bakers who had suffered from dermatitis had been using yeast foods or accelerators containing ammonium or potassium persulphate and that the outbreak of dermatitis followed a few months after the introduction of this chemical in yeast foods, a practice new in Australia.

Water suspensions or solutions of whole products were used in testing. A typical subject, when tested, shows a marked wheal and erythema to most of the substances mentioned above, particularly malt wheat flour, while the reaction to ammonium persulphate in 5 to 10 per cent solutions is a great wheal and marked erythema which persist often for days, whereas the other reactions disappear within an hour or two. Often the testing lights up a resolving dermatitis. A 1 per cent solution applied over a few minutes does not produce a marked reaction.

Individuals unaffected by dermatitis have not reacted to these substances. Does the practice of bleaching flours have any bearing on this question? A critical appreciation of the results so far obtained will be published later, but one is tempted to forecast that bakers' dermatitis in Sydney in 1929 resulted from the unfortunate association of allergic individuals with aqueous solutions of persulphate.—Charles Badham *et al.* (see previous abstracts). E. R. H.

The Use of X-ray Machines in Shops or Other Industrial Places—It was found that in the use of X-ray machines in boot departments of several city shops the erythema dose which might produce burns to the customer was over 25 minutes where all the rays come through a lead glass covering the screen, but that a leakage around the screen might lead to a burn in a shorter time. As the exposure when fitting a shoe is generally well under a minute

there would appear to be little danger unless the use were repeated on successive weeks.

The machines however revealed a very definite hazard to the operator, particularly from insufficient protection from leakage around the screen.

It was therefore recommended: (1) that all X-ray machines in shops or other industrial places should be licensed after testing and inspection by the Board of Health; (2) that the present machines be immediately protected to the satisfaction of the Board of Health; (3) that in the case of machines used for shoe fitting, a notice be posted warning customers that their feet should not be exposed for more than 3 minutes in any one month, and that the use of the machines to search for needles and such like bodies is dangerous.—Charles Badham *et al.* (see previous abstracts).

E. R. H.

Chronic Lead Poisoning in Infancy and Early Childhood—The Metropolitan Life Insurance Company, as a result of a recent inquiry among prominent pediatricists, calls attention to the large number of cases of lead poisoning occurring among infants and children. The brief note points out that a Boston physician reports 50 cases of lead poisoning among children at a Boston hospital during the past 6 years. In these cases the diagnosis was proved beyond doubt, the source of lead being the paint on cribs, woodwork and toys.

It seems obvious that the simple precaution of using zinc paints in these cases should be resorted to. Lead poisoning due to the use of nipple shields and of lead ointments on the breasts of mothers was also considered a source of poisoning by the physicians interviewed.—*Stat. Bull.*, Metropolitan Life Insurance Company, 11, 10: 4 (Oct.), 1930.

L. G.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

The Physiological Effects of Diets Rich in Egg Whites—Previous experiments on the physiological effects of various diets rich in protein showed that cooked, dried, commercial egg white is unsatisfactory for growth, reproduction, and lactation. In this paper a further study is reported of the effects of diets rich in egg whites. The egg white used included both a commercial dried, Chinese product, and egg white from fresh eggs. The egg white was cooked in various ways and a table shows the composition of the rations.

Albino and hooded rats were used as experimental animals. A nutritional disorder and death speedily result in young rats weaned from stock rations when fed diets rich in egg white, either cooked or raw, dried or fresh. It was found that as little as 5 per cent dried liver fed 3 days before the beginning of the egg white diet protected the rats from these symptoms.

On a ration containing 66 per cent of dried egg white, either raw, Chinese, or from raw, fresh eggs, pellagra-like symptoms later developed in the rats surviving the first few weeks, even though the rations contained 20 per cent of potent dried yeast. These symptoms were prevented or cured by 20 per cent of dried beef liver but not by 10 per cent. Lard and raw linseed oil were not effective either in preventing or curing the symptoms.

The results noted in this paper confirm previous reports suggesting caution in the use of as large quantities of raw egg white in invalid feeding as has been the common practice in many hospitals in the past. Furthermore, the fact that

many cases of eczema in children have been observed to be associated with a sensitization to egg white raises the question as to whether the early introduction of egg white into the somewhat restricted dietary of the child may perhaps need to be safeguarded with protective foods in somewhat the same way as its introduction into the diet of the rats in the present experiments.—Helen T. Parsons, coöperating with Eunice Kelly, *J. Biol. Chem.*, 90: 351 (Jan.), 1931.

The Destructive Action of Finely Divided Solids on Vitamin A—The purpose of the investigation here reported was to gain some information on the destruction of vitamin A which has been found to occur on standing. A vitamin concentrate of cod liver oil was used throughout the experiment. Fourteen powdered materials of different chemical constitution were used for the mixtures with vitamin A.

A table shows the destruction of vitamin A at different storage periods. From this table it is concluded that (1) destruction of vitamin A is general with all the powders though the rate of destruction varies; (2) the degree of destruction is the same regardless of whether the mixture is stored under carbon dioxide or air; (3) the destruction is progressive.

In view of the lability of vitamin A to oxidation, it was assumed that the destruction was due to the air adsorbed on the large surface of the powders over which the vitamin was distributed. To test this assumption, an experiment was made with nuchar, and it was found that

over 90 per cent of the vitamin was destroyed within 3 hours after mixing with the nuchar. A further test was made by removing the oxygen from nuchar and then determining whether the anaerobic char would protect the vitamin. It was found that the reduced char was as destructive as before treatment.

Experiments were also carried out with granulated lactose containing water and hydroquinone. The hydroquinone exerted a marked effect on the vitamin destruction. Only 5 per cent of the vitamin was lost in 15 days compared with 90 per cent lost in half that time when hydroquinone was absent. However, in 45 days the loss rose to 40 per cent, indicating that the inhibiting action of hydroquinone is temporary. Water was found not so effective as hydroquinone in reducing the loss of vitamin A. The author has further experiments under way to extend his knowledge as to the destruction of vitamin A.—Joseph Keats Marcus, *J. Biol. Chem.*, 90: 507 (Feb.), 1931.

The Mineral, Nitrogen and Fat Content of Some Varieties of Mature Bean Seed and of String Beans—The purpose of this work was to ascertain the copper, manganese, zinc, and iron content of some of the more common varieties of seed and string beans but it was found that only a few varieties had been analyzed for mineral matter. A table is given showing the analyses of 12 different samples, namely, navy, wax, pinto, great northern, lima, red kidney, white kidney, Burpee stringless, cut short, Kentucky wonder green beans, and Kentucky wonder edible hulls.

The mineral content of the different varieties was found to be high and rather uniform. The maximum ash content occurred in the seeds and hulls of Kentucky wonder string beans. The maximum phosphorus content was also

found in the Kentucky wonder green beans. This same sample contained approximately 3 times as much sulphur as any of the other samples. These different varieties of beans were found to be fairly well supplied with copper, manganese, zinc and iron.

It has been previously reported (Sherman, H. C., *Chemistry of Food and Nutrition*, 3d ed., 1927, p. 400) that in 1908 and 1909 when beriberi was at its worst among the Philippine Scouts the disease disappeared as a result of adding dried beans to the ration.

Experiments, performed largely upon fowls, have shown that while beef has some effect in preventing beriberi, an equal weight of beans is much more efficacious. It is probable that the curative property of beans for beriberi is associated with their high mineral content.—J. S. McHargue and W. R. Roy, *J. Nutrition*, 3: 479 (Mar.), 1931.

The Effect of the Use of Mineral Oil upon the Absorption of Vitamin A—Previous experimentation has purported to show that mineral oil in the diet interferes with the absorption of vitamin A. If this is true, its use should be restricted, and the present experiments were conducted in further study of this effect to determine the value or perniciousness of mineral oil as a laxative. Two experiments were made.

In the first part of the first experiment, rats which were late in developing xerophthalmia due to a change in the stock diet, and which weighed 190 gm. on the average, were given 1 drop of cod liver oil and 0.25 c.c. of mineral oil daily mixed with the basal diet. The mineral oil constituted approximately $2\frac{1}{2}$ per cent of the diet. Of 9 rats given this diet, 1 died from infected hydronephrosis.

Eliminating the 1 rat, the average weekly gain of the rats receiving the mineral and cod liver oil was 16 gm.;

of those receiving the cod liver oil without the mineral oil, 17 gm.; and those receiving the mineral oil with the addition of vitamin A lost 19 gm. weekly. To 1 of these rats, after a loss of 40 gm. in weight, a drop of cod liver oil was administered daily, no other change being made in the diet. Response was slow, but during the second week the cod liver oil produced a gain of 30 gm.

In the second part of this experiment, the test was repeated using more nearly standard rats—those depleted of vitamin A in 5 to 6 weeks and weighing 110 gm. The amount of mineral oil administered varied from 0.25 c.c. to 0.75 c.c. Of 5 rats fed 0.75 c.c. of mineral oil daily, the average gain was 2.6 gm. The controls receiving cod liver oil in the same amount but without mineral oil showed an average daily gain of 2.5 gm.

In the second experiment, 8 rats were used which had previously been depleted of vitamin A and which were receiving at the time of the experiment sufficient vitamin A to make gains of 2 or 3 gm. daily. Litter mates receiving the same vitamin A containing extract and which had made similar previous gains were used as controls. Five per cent of mineral oil was added to the diet of the experimental rats. Of the 5 rats given mineral oil, 4 died within a month, the fifth only maintaining its weight, probably due to its having previously stored more vitamin A in its tissues. The controls, however, continued to gain very slowly, indicating insufficiency of vitamin A.

From this it seems that rats getting only sufficient vitamin A to maintain their weight are unable to survive when given mineral oil. From these experiments it appears that rats receiving an adequate supply of vitamin A are not noticeably affected by the addition of mineral oil to the diet but that rats receiving barely sufficient vitamin A to produce a subnormal growth are ad-

versely affected. If the amount of vitamin A administered is adequate, mineral oil may be given without noticeable effects. It is suggested that if mineral oil is employed it should be accompanied by a generous amount of fat-soluble vitamins.—Jennie I. Rowntree, *J. Nutrition*, 3: 345 (Jan.), 1931.

The Effect on Foods of Fumigation with Hydrogen Cyanide—This covers the experience of the foods laboratory of the ministry of health and the work of others in connection with the retention of hydrogen cyanide in foodstuffs after the use of that substance for fumigation purposes. While possessing no germicidal or fungicidal properties, hydrogen cyanide is admirably suited to most of the requirements of an ideal fumigant for the destruction of rats, moths, weevils, and other vermin and insects in such locations as the holds of ships. It exerts no deleterious action on fabrics, painted objects or metals, is highly efficacious and is readily dispersed.

Three objections attend its use—the lack of a definite characteristic odor or other warning property, its high toxicity for man and the domestic animals, and its entry under some conditions into foods in amounts that may cause harm to the consumer or cause the decay of the food.

The amount of hydrogen cyanide constituting the threshold of danger to man cannot be fixed with definiteness. As little as 10 mg. per 100 gm. of food is cited as a possible harmful quantity. The author cites many instances of foods containing a higher amount of hydrogen cyanide than this possible minimum.

Dates, figs, honey, cocoa, bacon and sausages (all foods with a high moisture content), tested after having been aired 24 hours after fumigation, have proved to contain from 278 to 890 p.p.m. of hydrogen cyanide to air.

Fumigation by means of hydrogen cyanide carried out in excess of requirements, particularly when used on fresh fruits or vegetables, may lead to commercial destruction or damage by interference with normal respiratory processes, or by the modification of characteristic odor or tastes. The danger of hydrogen cyanide poisoning of foods stands in relation to the quantity of gas, the duration of application, the moisture content of the foods, the size of the particles or units of foods, methods of packing, and the period of ventilation after fumigation.

Foods treated with not more than 1 volume of hydrogen cyanide in 200 volumes of air, with subsequent exposure to the air, do not usually contain more than 20 p.p.m. of the intoxicant to the food products. Computation of hydrogen cyanide concentrations in fumigation are usually reckoned in terms of the weights of the liquid or solid hydrogen cyanides per unit of space fumigated. This is in contrast to

methods usually employed with some other liquid intoxicants (such as benzene), for which computations are based on parts of the gas formed on evaporation, having a vapor pressure equal to air under given conditions of temperature and barometric pressure. Relative toxicities are thus not always obvious in such terms as "parts per million."

The final estimate as to practical hazards entailed is indicated in the prefatory note by Sir George Newman, which says in part:

If the process is skillfully applied and due precautions are taken to prevent excessive absorption of gas, it would seem that no serious risk to health is likely to be involved. It must, however, be emphasized that indiscriminate treatment of food with hydrogen cyanide by inexperienced operators may be fraught with real danger to themselves and to the eventual consumer of the food.—

G. W. Monier-Williams, *Reports on Public Health and Medical Subjects*, No. 60, Abstr., *J. A. M. A.*, 96: 635 (Feb. 21), 1931.

CHILD HYGIENE

RICHARD A. BOLT, M. D., DR. P. H.

THE Section on Medical Service of the recent White House Conference on Child Health and Protection* has made such a notable contribution to our knowledge of the resources available for child hygiene throughout the country that its findings should be brought at once to the attention of all those working for the welfare of the child. A follow-up committee of this Section has been authorized by Chairman Wilbur

... to get over to the country at large as quickly as possible the importance of applying the knowledge we already possess and for which machinery exists; to consider all the implications of the reports; to determine definitely where further studies are required and to stimulate them; to determine the avenues through which the recommendations made by the Section can be most effectively put over and to determine the soundness of the methods employed in applying the knowledge we have.

It is timely, therefore, to place before the readers of the *Journal* some of the outstanding findings and recommendations of the Medical Section. The Committee on Prenatal and Maternal Care presented a very complete report, the general recommendations of which are as follows:

1. That there be improvement of obstetrical teaching of physicians and nurses.
2. That there be encouragement of post-graduate teaching of obstetrics, both in courses of 3 years' duration or less, by lectures and discussions in county, district and state society meetings and by means of extension courses.
3. That the publication be encouraged of more papers in medical journals on obstetrical

subjects, especially regarding the nature and need for maternal care.

4. That there be urged the licensure, education, annual registration and supervision of midwives in those states where midwives are attending confinement cases.

5. The adoption by all hospitals admitting obstetrical patients of the minimum standards for general hospitals caring for obstetrical patients as outlined in the American College of Surgeons Year Book for 1927.

6. That all obstetrical hospitals and nursing homes be licensed and supervised.

7. That professors and instructors of obstetrics continue to emphasize in their teaching and practice the necessity for conservative measures in obstetric delivery and warning against surgical interference without consultation.

8. Continued education of the laity to the necessity of adequate prenatal, intranatal, and postnatal care in obstetrics, and to the danger of abortions, toxemias, and infections.

9. That there be a joint committee on maternal welfare representing those national organizations having active maternity programs for the purpose of close correlation of the programs, agreement as to standards involving medical, nursing and other professional procedure, principles of organization and methods of application.

10. That national agencies agree on the content of a complete maternity program, as outlined in the complete report.

11. That national agencies review their opportunities to assist in maternal care programs, as suggested in the complete report.

12. That each community be encouraged to provide adequate facilities for maternal and neonatal care.

SUGGESTED OUTLINE OF A MATERNITY PROGRAM PART OF A GENERAL PUBLIC HEALTH SERVICE

Purposes:

Education of community in nature and need of prenatal, delivery and postpartum care.

Provide adequate medical, social and nursing care, whether in home or hospital, for these periods.

* For full report of proceedings see *Official Proceedings of the Section on Medical Service of the White House Conference on Child Health and Protection, Washington, D. C., February 19-20-21, 1931*, supplement to *United States Daily*, VI, 29 (Apr. 6), 1931, Washington, D. C.

Have every expectant mother under medical supervision.

Organization:

Coördination of all agencies interested in maternity and infancy work. There are two types of organization—the official, administered by the department of public health, and the unofficial, administered usually by a voluntary nursing organization. In either an official or unofficial organization the following agencies should coöperate:

Official:

State and local health departments
State and local public health nursing organizations
Local governing board of the district
Board of Education (coöperating with general health program)

Unofficial:

Local medical and dental societies
Nursing associations
American Red Cross
Welfare agencies
Parent-Teacher Association
Federated Women's Clubs
Men's clubs
Junior League
Church groups

Health Center:

Hospital, if possible
Standard equipment and supplies
Standard record forms
Prenatal
Infant
Preschool

I. Prenatal Care:

Medical:

Private physician whenever possible
Nurse assistant

Clinic:

Department of public health—state and local
Hospital
Private agency
Obstetrical Standards
Laboratory:
Urinalysis
Wassermann
Neisserean
Hemoglobin
Blood cell count as indicated
Thyroid—basal metabolic tests, as indicated

Dental:

Private whenever possible
Clinic

Nursing:

Public health nurse
Institutional

Qualifications

Standards for service
Center
Home visits
Social worker

Educational:

Group instruction and demonstration
Materials and outlines for course
Literature

II. Delivery Care:

Home—Sterile supplies and preparation of room
Physician
Nurse, private or public health
Hospital—maternity department—standards
American College of Surgeons

III. Postpartum Care:

Medical—examination
Nursing
Breast feeding

IV. Referring the child to:

Pediatrician
Infant Welfare Station

ASSISTANCE WHICH NATIONAL ORGANIZATIONS MIGHT GIVE IN A MATERNITY PROGRAM

I. Stimulate interest of local physicians, dentists and nurses in the value and need of prenatal care

In close coöperation with:

State and local departments of health
State and local medical societies
State and local nursing organizations
State and local dental societies

Through:

Articles in state, medical and dental journals
Speakers at state and local society meetings
Physicians
Dentists
Nurses

II. Education of laity in nature and need of maternity care

Publicity through:

Magazines
Local papers
Extension services
Men's and women's club programs through:
State board of health
State medical associations
State public health nursing association
State dental associations
Speakers on special subjects
Articles for local newspapers
Material for local physicians who address groups
Programs for study groups

Literature:

(This probably should be provided by the state, but it seems that there should be *standard* publications on the subject for the public health agencies)

Exhibit material

III. Provide postgraduate education

1. Medical—for general practitioners

Courses:

a. Institutes—through state departments of health and state medical associations

b. Medical colleges

Prenatal care

Delivery care

Postpartum care

2. Dental

Nutrition and teeth

Advice and dental care for the expectant mother

3. Nurses

Institutes—through state division of public health

Nursing and state nurses associations

Maternity care

Infant care

Teaching prenatal care to groups

Outlines for group instruction

Demonstration material

IV. Improving type of midwives

Education

Licensing, annual registration, supervision—state responsibility

Annual refresher courses

Outlines and material

V. Stimulate interest in establishment of whole-time health units

Medical organizations

Dental organizations

Nursing groups

Governmental boards

Laity

Demonstration of complete maternity program

Bring maternity departments of all hospitals up to American College of Surgery minimal standards

Revision of stillbirth and maternal death reports

Make septicemia universally reportable

The report of the Subcommittee on Health Centers* was enlightening and gave an excellent picture of the distribution, scope and influence of health centers throughout the United States.

NUMBER AND DISTRIBUTION OF HEALTH CENTERS

The distribution of the 1,511 health centers throughout the country, according to states from which questionnaires on health centers were returned, is as follows: New England States, 295; Middle Atlantic, 550; East North Central, 266; West North Central, 63; South Atlantic, 162; East South Central, 49; West South Central, 59; Mountain, 40; Pacific, 117.

These centers are carried on, 643 directly by official (usually municipal) agencies; 636 by nonofficial agencies and supported by voluntary funds; and 232 are called "co-operative," which means that both official and volunteer agencies are concerned with the support of the centers. The number of independent units conducting work at health centers is considerably larger than the figures indicate, as in a number of instances an organization in a large city may carry on work in multiple centers and make a single report embracing the total volume of work.

Seven hundred and twenty-five, or 48 per cent of the total number, were directed by nonofficial organizations; 729, or 52 per cent, by county or municipal departments of health; and considerably smaller percentages by the American Red Cross, various hospitals, child health organizations, case-working agencies, tuberculosis associations, etc. Many of the health centers conducted under the above auspices were in affiliation with other organizations, official or voluntary.

THE CHILD HEALTH CENTER AN APPROVED MEANS OF HEALTH PROMOTION

The child health consultation—whether at a permanent or temporary locale—is becoming an accepted means of bringing the infant or young child to an accredited physician for physical examination and advice, for the promotion of health and for the detection of disease or of bodily defects. Treatment is not undertaken in a child health center. If disease or remediable abnormality is discovered, the patient is referred to a physician or hospital for the desirable curative treatment.

The experimental stage is nearing its end. There seems to be general agreement that the periodic physical examination of the young child throughout its formative years is desirable and that the health center provides a method to accomplish this purpose for those children in families of limited means.

* Presented by Dr. J. H. Mason Knox.

THE CENTER AS A HELP TO PHYSICIANS

We believe that a small proportion of the children examined at these consultations have been under regular medical supervision before, that the practice of the physicians of the community is rarely interfered with by the examinations conducted at a health center, but on the contrary that, as a result of the health center, local physicians receive at their offices many patients who would not otherwise have consulted them. Moreover these referred children in need of treatment are, on the average, suffering from less advanced disease and from less severe physical defects than would have been the case had they deferred coming until brought by their parents without the suggestion of the health center.

We believe that the centers or conferences should receive only infants and children supposedly well and that sick children and those in need of corrective treatment should be referred promptly to physicians or hospitals.

PREVENTIVE CARE A COMMUNITY
RESPONSIBILITY

The majority of the children brought to the average health center are from families of limited means. We believe that a determination of their physical condition and the furnishing of advice in health matters is as much a community responsibility as is the offer of free elementary education. The latter is frequently hindered or nullified because the physical or mental status of the pupil has not been ascertained.

As has been true in other kinds of philanthropic endeavor, the first child health centers were the result of the vision and interest of private individuals or various charitable organizations, industrial plants, hospitals, and similar groups. This accounts in part for the many variations in the emphasis which is placed upon certain forms of activity carried on in different centers and for the variation in the composition of the staffs. Each has developed as the special needs of the child popu-

lation of the given community impressed the patrons.

This method of development in the main has been of advantage, for it has led to the trial of many forms of service in the centers, the value of which could only be determined by experience.

It would appear that further attempts should be made to set up certain standards of operation in order that the work of the many centers may be comparable.

Gradually the wisdom of expending public money for this purpose, either as grants to existing centers or for the establishment and maintenance of child health centers or consultations as part of a public health program, has been recognized.

In addition to the 6,198 child health centers and the numerous itinerant conferences maintained by the bureaus of child hygiene, 693 of the 1,511 permanent centers studied by our committee receive their principal support from public funds. Many others receive part of their support from the same sources.

RELATION WITH HEALTH OFFICIALS AND
COMMUNITY ORGANIZATIONS

Our studies indicate that even where the centers are established and maintained by private funds they very generally cooperate actively with neighboring agencies operating in the fields of health and social service. We believe that it would be advisable to go further and make each health center a co-ordinated part of a public health program with the cooperation, or under the supervision, of the local official health agency, certainly in those instances where there is a full-time health officer responsible for health conditions in his territory. Such an official should use the center or the consultation as far as practicable in determining the physical condition of the young children who are not under the regular care of their own physicians. This official use of the center will broaden its work and make it of greater value in improving the sanitary standards of the child population.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

This Will Help the County School Nurse—The Children's Fund of Michigan recommends the following as a simple first aid kit for rural schools:

Container: A small tin or pasteboard box with a cover. (A candy box will do)

Contents: 1. A half ounce bottle of 2 per cent mercurochrome with a rubber stopper and a glass rod 10c
(In districts where there might be objection to an antiseptic, use liquid green soap for cleansing)

2. One tube plain vaseline 10c

3. One yard of $\frac{1}{2}$ inch adhesive 10c

4. One two-inch bandage 15c

5. One-half dozen safety pins 5c

Total 50c

Articles which may be contributed by the children as they become interested in the use of the kit:

1. Toothpicks for cleaning nails
2. A small brush for use in scrubbing hands
3. Blunt scissors
4. Old muslin which has been boiled and ironed with a hot iron, then wrapped in freshly ironed newspaper
5. One square yard of old sheeting for arm slings
6. Old newspapers for making a splint for a broken arm
7. A stick and a stone for a tourniquet—

A Simple First Aid Kit for Rural Schools, From Children's Fund of Michigan, *Michigan Public Health*, XIX, 1: 18 (Jan.), 1931.

Teacher Training Courses for Home Hygiene Instructors—Public health nurses are being called upon more and more to teach classes in health and

hygiene. Some of the states require that each student before graduation from high school complete one unit in a health subject, and the school nurses are often asked to teach this course. The preliminary professional training of the nurse seldom if ever includes any special preparation for teaching. Some have fortunately had teaching experience before entering the profession of nursing, but that is the exception rather than the rule.

Since 1908, the American National Red Cross has organized and taken the responsibility for furnishing teachers for classes in Home Hygiene and Care of the Sick. Last year there were 3,233 classes taught in more than 1,000 different communities—2,085 of these classes were taught in the schools. Over 1,500 graduate nurses were authorized as home hygiene instructors. So few nurses are generally prepared to teach, that the American Red Cross, in order to meet its responsibility to provide teachers for the classes, has organized teacher training courses in several universities. These are given during the summer when many nurses are free to attend. Courses cover theoretical work in Principles of Teaching and also practical work in the Methods of Teaching. For those nurses who are expecting to teach classes in Home Hygiene and Care of the Sick a preparatory course of this kind is invaluable. There is an immeasurable benefit derived from being able to apply the essentials of teaching to the actual practise teaching of health subjects under the expert guidance and supervision of skilled instructors.

The Teacher Training Courses for

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

Home Hygiene instructors are being offered this summer at:

Pennsylvania State College, State College, Pa.,
June 29 to August 7 inclusive

Colorado Agricultural College, Fort Collins,
Colo.,

July 6 to August 14 inclusive

University of California, Los Angeles, Calif.,
June 22 to August 1 inclusive

The course at the University of California is restricted to nurses in the Pacific Branch Area of the American Red Cross.

Many nurses keenly appreciating their need of definite training in teaching have taken advantage of these courses. Application to the American National Red Cross for enrollment in the Teacher Training Courses should be made previous to the opening of the various summer schools.

HELEN BEAN

Public Health Nursing Rural Teaching Center, St. Francois County, Mo.—St. Francois County is situated about sixty miles south of St. Louis, and is in the heart of the "Lead Belt," which produces one-eighth of the lead supply of the United States. Lead mining, therefore, is the chief industry. Some farming is carried on in the northern and southern parts of the county; and tiff-digging and tie-hacking furnish employment to a few.

Although Farmington is the county seat of St. Francois County, Flat River was chosen as headquarters for the County Health Department, because it is the center of population and also the geographical center of the county. Flat River itself has a population of 8,000, but is unincorporated. The county has a population of 36,000, and covers 458 square miles.

The St. Francois County Health Department began its work in July, 1922, and consisted of a full-time county health officer, one nurse, a sanitary officer, and an office clerk. As the work

has grown, nurses have been added to the staff. At present there are three staff nurses, and a chief nurse.

The county is divided into three nursing districts. The nurse in the Farmington district has office space with the Farm Bureau agent in the Court House. The nurse in the Bonne Terre District has a small building donated by one of the lead companies; and the nurse in the central district has her office at county headquarters in Flat River.

The present budget for the County Health Department is \$20,000. This is contributed by the International Health Board, the Missouri State Board of Health, the county court and the two lead companies. The lead companies contribute 80 per cent of the total amount.

The teaching center was opened in Flat River in January, 1930, with Maud Tollefson as chief nurse and supervisor of student experience. Nurses of one group who are eligible for this experience in rural nursing are the students enrolled for the Washington University course in public health nursing. For this field work they receive credit toward the Certificate in Public Health Nursing. Certain other graduate nurses, especially qualified both professionally and personally, are also accepted. They must apply for admission to Pearl McIver, State Supervising Nurse of the Missouri State Board of Health. Students from either group may apply for the Rockefeller stipend of \$90 a month. This has been granted to nurses who wish to do rural public health nursing in Missouri.

Since a broad generalized program is carried out in St. Francois County, the students have the opportunity to observe or participate in the following activities: writing and filing of records and reports, and other routine office work; community organization; infant and school hygiene; communicable dis-

ease control; sanitation; clinic work; group teaching, and other health education activities.

One student is assigned to each staff nurse, and lives in the district to which she is assigned. During the first 2 weeks, the student observes the work of the staff nurse, attends three 2-hour lectures a week given by the County Health Officer, Dr. W. W. Johnston, and has group and individual conferences with the chief nurse.

During the next 2 weeks the school nursing demonstrations are given by Miss Tollefson, and the students spend most of their time in school work. They are permitted to work alone as soon as they are able. During the last month the students work alone, under periodic supervision. Each is assigned definite pieces of work and is held responsible for the accomplishment of these assignments.

The demonstrations continue once a week during the last 4 weeks, and cover the other types of service in the county. Individual and group conferences are held at suitable times to give the students an opportunity to discuss the work accomplished and to ask questions. The students attend also the regular weekly staff conference and a few special lectures. One lecture is given by Dr. Emmett Hctor, psychiatrist at State Hospital No. 4 for the mentally diseased, at Farmington.

Besides keeping the daily and monthly reports required by the State Board of Health, the students keep a field experience record of all activities: reading, lectures, conferences, observations, visits, practice, etc. Each student also works out some project of especial interest to her.

Field trips to the county institutions and other points of interest are arranged, and county officials and other cooperating agencies are visited. The last week is spent visiting the different bureaus of the State Board of Health,

and other state departments and institutions, among which is the U. S. Public Health Service Trachoma Hospital at Rolla.
M. T.

The Nurse in Education and Administration—The Mt. Sinai Hospital School of Nursing in New York City celebrated the golden anniversary of its founding at the New York Academy of Medicine, March 4. Laura Logan, Superintendent of Nurses of the Cook County Hospital, Chicago, a graduate of the Mt. Sinai School, was among the speakers. Her address follows in part:

The supply and demand study made by the Grading Committee for Schools of Nursing in 1928 showed that over 20 per cent of the nurses of the country were engaged in institutional nursing, over 20 per cent in public health nursing, and some 54 per cent in private duty nursing. It is known that only a small per cent of those doing institutional nursing are engaged as staff or bed-side nurses.

The grading study brought to light startling and significant facts with relation to the nurse in the field of nursing education. It showed that although there is an over supply of nurses in the field of private duty and with the present annual output of over 20,000 graduates this condition of unemployment is likely to grow worse—it proved that the supply of well prepared teachers, administrators, supervisors and head nurses for schools of nursing and for the field of public health is inadequate.

The recent White House Conference strikingly showed how important a part the nurse is expected to play in the nation's program for child health and development.

We have few figures to show that a well run nursing school is cheaper than the same service rendered by a well prepared paid graduate nurse personnel but we have figures to show that a good nursing service adequate in members is an economy to the hospital, while a poor nursing service is a direct liability—it shows up in the death rate, in the length of hospital stay, in the confidence and the good will of the community toward the hospital.

Society is changing its attitude toward the work of the nurse—this is measured by the rapidity with which universities are making a place for her preparation and by the importance of her place in the public health program. The nurse within the last 50 years has become a very important instrument or agent

of science in the application of its benefits to the race. It is therefore highly important that this agent, the nurse, be carefully selected, have a sound preparation in the sciences and the skills which are fundamental to good nursing. The administrators, supervisors, teachers, and head nurses in schools of nursing must not only be well prepared nurses but educated women skilled in the understanding of educational policies and of social and economic sciences, and so be able to incorporate into the training of the nurse that which will fit her especially in her professional service to society and also all that will fit her to live as a good citizen and to do her part in promoting a high quality of human life.

Endowments in universities are contributing to the preparation of professional workers no more important to social welfare than is the nurse. May we not expect from the community a recognition of need of endowment for schools of nursing and from the great body of medical men support and assistance in placing nursing on an academic and social basis comparable with other professions open to women?—

News Release of the United Hospital Fund of New York, Mar. 4, 1931.

These Would Raise the Standards
—The New York State Health Commission appointed by Governor Roosevelt in 1930 has presented to the Governor its preliminary report dealing mostly with health matters involving legislation. The following are recommendations in the report dealing specifically with public health nursing:

1. That county departments of health be developed throughout the state with a qualified supervising nurse under the direction of the health officer, who will teach, supervise and coördinate the work of all public health nurses employed in the county.

2. That the Department of Health be given facilities to continue and extend its efforts to promote the qualifications of public health nurses in the state.—

Health News, New York State Dept. of Health, VIII, 7: 25, 28 (Feb. 16), 1931.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Montreal, September, 1931—Education and/or publicity will be well represented on the A. P. H. A. program. The Public Health Education Section hopes to welcome many who could not get to Minneapolis or Fort Worth. The date is so early in September that some may find it convenient to plan a vacation in Canada to end with a stop at Montreal.

"For The Good of The Order"—Quite apart from the program sessions it is hoped that several small groups would like to get together at luncheon or dinner to talk over "where are we going in popular health education?"

If you wish to put in a noon or early evening in such a discussion please write to the editor. Have you questions to raise as to the present or future status of health education?

Special: Cancer Education—Newspapers announce that through the will of Egbert C. Fuller a fund of \$1,500,000 will be devoted to research, care of patients, and the *education of the public as to the prevention and treatment of cancer*.

Health Education in a Survey Report—The Philadelphia Hospital and Health Survey includes 7 lines in the Appraisal of Public Health Activities; 5 pages on "Educational and In-

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

important public and college libraries.

Please check to see that the address is on lists for mailing all types of periodical or special material—reports, educational pamphlets, news, etc., etc.

HONORABLE MENTION

To National Tuberculosis Assn.: for giving date of publication on two pamphlets on school health topics.

MAGAZINE ARTICLES

Middletown, N. Y., March *Bulletin*, mentions that in *Delineator* for September Celia Caroline Cole gave some wild advice on the care of the eyes. Can you get some women's groups interested in health to write to the editor?

"The Care and Feeding of Adults," by Logan Clendening, M.D. *Collier's*. Mar. 21, 1931. "Get a doctor of your own." "How very delicate adults really are" . . . "watch a crowd around a soda fountain."

"Hard-boiled Mothers: Yesterday's Flapper as Today's Modern Parent," by Marian Castle. *Woman's Journal*, 171 Madison Ave., New York. Apr., 1931. 25 cents. For perplexed parents—and worrying elders.

"Hold Your Horsepower"—editorial. *Collier's*. Mar. 14, 1931. "Reckless driving in 1930."

"The Influenza of 1918," by W. A. Evans, M.D. *Liberty*. Feb. 7, 1931.

"Medicine and the Middle Class," by W. M. Johnson. *Atlantic*. Mar., 1931.

"Oh, Doctor!"—editorial. *Saturday Evening Post*. Mar. 21, 1931. Few medical men "have that peculiar gift for separating simple essentials from intricate surroundings" in presenting health information.

"Secretary Wilbur and the Cancer Cure," by M. A. Hallgren. *Nation*, 20 Vesey St., New York. Apr. 8, 1931. 15 cents. How a "cure" was patented.

"Specialists at Large," by D. D. Bromley; "The Cosmetic Urge," by

Jeanette Eaton. *Harper's*. Feb., 1931. "Tonsil Tricks," by Fassett Edwards, M.D. *Collier's*. Feb. 21, 1931. "Just what to do about tonsils baffles many of our best people."

EDUCATION—PUBLICITY

The Cancer Program in Massachusetts, by George H. Bigelow, M.D.—Committee on the Costs of Medical Care. Includes educational activities. *Free*.

"Health for Better Adventures," by Prof. C.-E. A. Winslow. *World's Health*. Oct.–Dec., 1930. Convention address to American Red Cross urging the need of wider development of Red Cross health program.

"Health Propaganda Methods," by Dr. John Macmillan. *Public Health*, London. Feb., 1931. Need for health education by health departments; evaluation of effective means.

"The Importance of Cancer Publicity," by Ella H. Rigney. 9-page reprint from *Hospital Social Service*. Description of nature, extent and results of publicity by New York City Cancer Committee, 34 East 79th St. *Free*.

"Methods and Aims of Popular Health Education in Germany," by Prof. Adam, secretary-general, Reich Committee on Popular Health Education. *World's Health*, 2, Avenue Velasquez, Paris, France. Oct.–Dec., 1930. 50 cents. Development and extent of popular and school health education.

"The Philosophy of Health Education in the Clinic," by Iago Galdston, M.D. *Hospital Social Service*, New York. Jan., 1931. For reprint, address author, New York Academy of Medicine. Read the paper for the philosophy. The application:

In a large number of our clinics a visiting patient is obliged to wait from 5 minutes to an hour before his turn comes. In the majority of clinics such a patient sits looking empty-eyed about him, or discussing his condition with his neighbor, or again, perhaps

reading a newspaper or a frayed magazine. How much better it were if the waiting patient could spend his time reviewing posters, graphs, charts and photographs, or looking at stereopticon views or daylight motion pictures. Instead of the frayed magazine, could we not supply him with attractive literature dealing with health? Could we not entertain him and render his wait less tiresome by showing him stereopticon views or motion pictures?

"Popular Education," by Florence B. Sherbon. *Eugenics*, New Haven, Conn. Jan., 1931. 30 cents. Why "propaganda" (objected to by Dr. Pearl) is needed for advance of eugenics.

"Summary of a Social Hygiene Survey of Washington, D. C.," by Walter Clarke. *Journal of Social Hygiene*, 450 7th Ave., New York. Feb., 1931. 35 cents. Under "Social Hygiene Education" a valuable review of activities in homes, public schools, churches, social agencies and adult clubs.

The Summary of Educational Methods in Mental Hygiene is being prepared for publication by National Committee for Mental Hygiene. An advance report on talks and lecture courses, in *Mental Hygiene Bulletin* (Jan.-Feb., 1931), names 22 books listed 4 or more times in reading lists given out by speakers. It is interesting that only one book was recommended as many as 12 times.

POSTERS

"Making Health Charts," by Pearl Turner. *Public Health*, Mich. Dept. of Health. Feb., 1931. "A chart is a sort of catalog or category—it is a collection of small pictures all pertaining to one subject"—such as "Foods Containing Iron." Working suggestions—but please delete "small" before "pictures." *Free*.

"Charts Make Facts Convincing," by Margaret Merwin and Helen Davis. *Public Health Nurse*, 450 7th Ave., New York. April, 1931. 35 cents (easy to borrow a copy in your city).

Here "charts" are diagrams and placard statements—not groups of "small pictures." Uses discussed: in reports and exhibits, for speeches, articles, letters, materials, lettering, titles and labels, reproduction of charts.

A "mother and baby" poster—actually a poster and not a placard—in color—sketch by Sundblom—19" x 25"—with these words in small letters at the bottom: "Compliments of Evaporated Milk Association." *Free*. Address: 203 N. Wabash Ave., Chicago.

Safety posters—some especially good—some not so good—are supplied by Employers' Mutual Liability Insurance Co., Wausau, Wis. *Free*.

Once a month a new health or safety poster is displayed in all Western Electric plants. Better than average quality. *Copies not available*.

Both above series of posters are about 9" x 12". Both groups will be shown at Montreal.

Those interested in the desirability of bill-board posters for health education will wish to see *Roadside Bulletin*, Natl. Council for Protection of Roadside Beauty, 119 E. 19th St., New York. *Free*.

ANSWERS

Asked for: "exhibits that could be used at state or county fairs—especially activity exhibits." *Answer:*

There are practically no readymade exhibits available through national or other organizations. One of the very few exceptions is the U. S. Children's Bureau, Washington, D. C., to which I suggest that you write.

Inquiry:

Our Association is planning a health exhibit at two of the fairs in the county this fall. I shall be glad of any suggestions for posters along health lines or any exhibit that would be attractive for this purpose. We are planning on three departments, we might call them. One each might be periodic health examinations; prenatal work, maternal and infancy. In the third division we might use some diphtheria prevention work, vaccination work and nutrition if our space is ample.

Answer:

The job of planning the exhibits—and the bigger job of presenting them to the fair visitors would be simplified if you could content yourself with but two or even one subject.

Why not make a big splash in one subject? Pick one of the seven you mention—one that you will emphasize especially this season, the one you can exhibit most effectively.

A list of poster sources is supplied by National Health Council, 450 7th Ave., New York, for 10 cents.

Reference to the newer posters will be found under Education and Publicity, in the monthly issues of the *American Journal of Public Health*.

Under the same heading, in various issues, the *Journal* offers many suggestions on making exhibits.

Inquiry:

The Tuberculosis and Public Health Society is now coöperating with the Medical Society in arranging health talks to be broadcast over our local station. I would appreciate it very much if you could give me some suggestions as to subjects that would be desirable in such a program.

Answer:

The best source of information regarding topics and prepared talks for radio use is the Education and Publicity Department in the *American Journal of Public Health*. I think you can do no better than to go through the files for several years back.

To which was added several specific sources already mentioned in this department.

TITLES AND PHRASES

Some of these titles may suggest new slants on old topics—new ways of saying old stuff.

"The Inside of Your Head"—or "Mental Hygiene?" Which article will get the more readers?

"Are Modern Parents Failures?"—*Hygeia*. "In defense of parents."

"The Cup That Spreads Disease"—Connecticut State Dept. of Health.

"Dental Secrets of Hollywood"—*Popular Health Magazine*.

"Deprived of his birthright!"—(advertisement) Mother's milk.

"Mental Disease is Preventable."

"Mental Health is Procurable."—Massachusetts Society for Mental Hygiene.

"New Styles In Health" and "It's Smart To Be Healthy"—*Better Health*, Syracuse Dept. of Health.

"The Old Oaken Bucket May Be Full of Germs"—*Hygeia*.

"One Little Whooper Starts Epidemic"—*Everybody's Health*, St. Paul.

"Physical Illiteracy"—*Hygeia*.

"Riders of the Plagues"—the story of the conquest of disease by J. A. Tobey.

"Sanitary Etiquette"—*Ohio Health News*, State Dept. of Health.

"Twentieth Century Vipers and Vapors"—quotes about health fads of 17th century. April, 1931, clip sheet, N. J. Tuberculosis League, 21 Walnut St., Newark. *Free*.

"Why Are Statistics Vital?"—*Pennsylvania's Health*, State Dept.

"Youth is the Strength of America; Make American Youth Strong"—Am. Child Health Assn.

Copies of *Hygeia* (535 N. Dearborn St., Chicago) *free*.

REPORTING

"Alaha from Phil Platt" is written on the cover of the report of Palama Settlement Work, Honolulu. Palama is somewhat like Henry Street Settlement in that it carries a city-wide nursing service; in addition it is the center for community health and recreation activities. Among interesting features of the report are: self-indexing (like unabridged dictionary); "Milestones": "For 33 years a center for free medical service to the poor"—"For 25 years provided a public health nursing service"—and so on. Probably copies on request.

A Chronological Report: Significant Events and Steps in the Organization and Progress of the Cattaraugus County and Syracuse Health Demonstrations—State Charities Aid Assn., 105 East 22d St., New York. Valuable document for students of these demonstrations.

A Day With The Visiting Nurse—Instructive Visiting Nurse Assn., Washington. A 9-fold folder—letter enclosure size. The story told in pictures with text and brief titles and plenty of white space. Dull finish paper is used. *4 cents for copy.*

Recent Progress in Health Organization in Honolulu, by Philip S. Platt, Palama Settlement, Honolulu. 8 pp. illus. *Free.*

Report of the Connecticut State Tuberculosis Commission—marked by the numerous page illustrations and the many pages of small type lists of contributions and services of various kinds.

Reporting within the family—and gleaned data from many sources is discussed in an especially helpful article—"Relating Hospital Service to Community Needs," by A. C. Philips and D. Dunker. *Trained Nurse*, 486 4th Ave., New York. Feb., 1931. *35 cents.* Many suggestions could apply to departments and other health agencies.

"Saving Life by Preventing Illness"—happy title—is "A Review of the work of the Tuberculosis and Health Society of Detroit and Wayne County for the year 1930"—51 Warren Ave., West, Detroit, 8 pp.—3¼" x 9"—rough paper—large type—readable—no statistical tables. *Copy free.*

The Year's Progress—Philadelphia Health Council and Tuberculosis Committee—a 12-page narrative report—several illustrations—1 page financial statement including functional classification of expenditures. *Free.*

CONTESTS

Scribner's Magazine, New York, offers prizes of \$1,000 and \$500 for narratives of 2,500 to 6,000 words. Closes June 20, 1931. "The stories must relate to some phase of American life."

Public health in some of its aspects offers rich source material for the writer.

The Hospital Committee, Raleigh Woman's Club, offers prizes for best papers by high school students on "The Value of a Hospital to a Community." Details in *Health Bulletin*, North Carolina State Board of Health. Apr., 1931. *Free.* Local clubs might sponsor essay contests on other health subjects.

Year after year the Association of Infant Welfare and Maternity Centres, London, conducts a group of contests for children, mothers and communities. A health talk by health workers was judged by medical men and by a group of mothers. Address: 117, Piccadilly, London, W. I., England.

The 10th annual health poster contest is being conducted by the Anti-Tuberculosis Society of Schuylkill County, Pa. For high school, 7th and 8th grade students.

Two contests—training student essays, and play or pageant writing—are being conducted by American Nurses' Assn., 450 7th Ave., New York.

VOLUNTEERS

"High Voltage Volunteers—How to Get Them—Train Them—Keep Them," by J. A. Wolf. *Survey*. Nov. 15, 1930. "Only a fraction of the work in the vast field . . . could be done without volunteers."

"The Volunteer of the Junior League and Public Health Nursing"—"County Volunteer Service"—"The New Volunteer." 3 articles on the great untapped resource for public health work. *Public Health Nurse*. Mar., 1931.

NEW

Bulletin, Pennsylvania Heart Assn., Philadelphia.

American Journal of Orthopsychiatry, 145 E. 57th St., New York.

BOOKS AND REPORTS

Child Health—By *Norma Selbert, R.N.* Philadelphia: Saunders, 1931. 239 pp. Price, \$1.60.

This volume is a companion to the author's book *Home Care of the Sick*, and is intended primarily for courses in child hygiene and in adult education in child care, which are now being introduced in a number of our universities. The book is in the form of a compendium of information pertaining to child health and covers the period from conception through school age. It is written with a sketchy, easy style in non-technical language.

Mrs. Selbert has drawn exhaustively from the literature on child hygiene and practically every page contains one or more references. The various factors concerning child health are boiled down to lowest terms and in some places are stated with dogmatic assurance. The whole book is non-controversial even in those parts where a question might be raised regarding lack of definite scientific information.

The book opens with a bird's-eye view of the evolution of child health work, especially in the United States. The second chapter, taking up problems affecting the growth of children, sets forth briefly some of the factors which condition children's growth. An attempt is made to state the modern concepts regarding parental education and the various psychological elements which enter into relationships between parent and child. While a considerable amount of information is assembled within small compass, it seems that could a greater amount of space be given to the subject, better proportions would result.

The chapters on prenatal care and

the natal period conform closely to other literature on this subject. The procedures on the whole are standard ones. The nursery school movement is traced briefly and the development of the nursery school in America is outlined. The chapter on the school child and the adolescent presents material gleaned from diverse sources. The effect of child labor on the child is treated in a very concise but satisfactory manner, and a chapter devoted to the use of leisure time and health camps is very applicable at present when we are seeking to build better health standards for summer camps.

The book contains a wealth of illustrations bearing upon the various subjects under consideration. In other words, this book is a condensation of present knowledge on child hygiene, written in non-technical language, and accessible for ready reference. It does not pretend to offer original investigation or take up controversial matters. It should be of value in conducting informal health education, and serve as a reference book for classes in child hygiene.

RICHARD A. BOLT

Proceedings of the Fourth Annual Conference Maryland Water and Sewerage Association, Hagerstown, Maryland, May 13 and 14, 1930. 120 pp.

This publication, which is prepared in good style and includes a number of interesting illustrations, covers a variety of subjects. Garbage and refuse collection and the reclamation and disposal of trash; sewage treatment problems, and various phases of water procurement and purification are covered.

ARTHUR P. MILLER

Nervenärztliche Gutachtertätigkeit.
Dargestellt für die praktizierenden
Ärzte—By Dr. Max Scrog (Leipzig,
Georg Thieme), 1931. 60 pp. Price,
M. 3.60.

This booklet treats mainly of neuroses due to trauma of the peripheral and central nervous system. It discusses the basic principles involved in the handling of such cases, and notes their relations to accident and health insurance. Numerous examples drawn from a wide experience clarify and illuminate the discussion. Cases arising in the course of military service in the World War are treated in a special chapter. The psychiatric aspects of the subject are only briefly discussed. C. A. KOFORD

Therapeutic Uses of Infra-red Rays
—By W. Annandale Troup, M.C.,
M.B., Ch.B. London: The Actinic
Press, Ltd., 1930. Price in U. S. A.,
\$1.50.

This is said to be the first book published in Britain devoted specifically to therapeutic use of infra-red rays. It appears to be based upon the experience of the author in his own practice but includes frequent references to the rather scarce literature on this application of heliotherapy.

Certain statements which are unsupported by evidence or reference are likely to be questioned by one conversant with the general laws of optical physics, for instance, "The depressing effects of the tropics . . . have been attributed to infra-red rays . . . the ultra-violet rays are practically entirely absorbed by water vapor. . . ." It is generally accepted that water *per se* does not offer serious interference with ultra-violet transmission, and also that energy from $\lambda 14000$ to $\lambda 80000$ is practically entirely absorbed by even 1 inch of water.

The suggestions made of the mutual assistance or interference of ultra-violet and infra-red seem to have an empirical

basis not entirely in accord with all published data.

In the main it appears that the scientific facts are soundly set forth. As to therapeutic practices, these are to be judged in the light of results obtained until more basic knowledge of fundamental facts as to the cause of these can be worked out.

The book should serve as a useful guide to the practitioner, who will, in all probability, pursue a course of trial and observation, rather than follow literally exact procedures recommended.

Quoting from the foreword by Sir William Wilcox, ". . . the use of infra-red irradiation by medical practitioners will prove a really useful . . . form of clinical research."

JOHN W. M. BUNKER

Handbuch der Tropenkrankheiten—
herausgegeben von Prof. Dr. Karl
Mense. Ed. 3 (Leipzig, Verlag von
J. A. Barth), Johann Ambrosius
Barth, Leipzig C 1, Germany, 1929.
Teil 1, 846 pp., 362 figs.; Teil 2, 847–
1418 pp., figs. 363–556. Rm. 90.—

The fifth volume of this well known and much appreciated treatise on tropical medicine has now been published. It is of prime interest, because of the inclusion of helminth diseases, relapsing fever, and other spirochetoses, Chagas' disease, and yellow fever, and the protozoan parasites of the blood of vertebrates.

The general section deals with the distribution and favoring conditions for the various helminth infections of man, such as ascariasis, oxyuriasis, trichocephaliasis, ankylostomiasis, dracontiasis, filariasis, trichinosis, schistosomiasis, and the principal cestodes of man. Accessory and intermediate hosts, and vectors of the helminths of man, the distribution throughout the world and among different peoples, of the parasitic worms, the clinical signs of helminth infection, the action of the worms on the

host, helminth plagues and diseases, the detection and differentiation of worm infections by fecal examination and culture, by the radioscope, and by immune reactions, and the treatment and prevention of helminth diseases are summarized. In the special section each important parasite receives detailed discussion.

The spirochetoses receive an extended discussion of 250 pages at the hand of Dr. H. Ruge of Hamburg.

Dr. Carlos Chagas of Rio Janeiro, assisted by Dr. Villela and Dr. Rocha-Lima, brings the subject of American trypanosomiasis up to date, noting especially the cardiac and neurotropic aspects of the infection and the disease. The armadillo is the reservoir mammal and *Triatoma*, a kissing bug, the insect vector.

The chapter on yellow fever is of especial interest to American readers, not only because of the repeated invasions of "Yellow Jack" into the United States, and because of the extensive quarantine system in vogue against it, but primarily because of the contributions of the late Dr. Noguchi to its solution. The bibliography contains 33 articles from his pen. They cite the difficulties in the way of accepting Noguchi's *Leptospira icteroides* as the etiological factor, and the conclusion is reached that the Brazilian and the African yellow fevers are identical. Investigators are not absolved from continuing the Noguchi hypothesis within the scope of further investigation, though they appear to be unconvinced of its correctness.

Part two of the fifth volume of this monumental treatise on tropical medicine is given over wholly to the protozoan parasites of the blood of vertebrates. The treatment of malaria and of the species of *Plasmodium* afflicting man is found elsewhere in the third volume. The species of this genus occurring in other vertebrates are, however,

included here with the other Hemosporidia.

Professor R. Kudicke of Canton, China, is the author of this section of the work, with the exception of the part dealing with African sleeping sickness, which is written by Professor Carl Mense, the general editor of the entire work.

The invasion of the blood stream by the Protozoa occurs throughout all of the classes of vertebrates, but is best known among land vertebrates, perhaps in part because of ecological considerations, but on biological grounds because of the access of blood-feeding Arthropoda. Thus in this phylum several families, many genera, and still more species, are vectors of blood flagellates, or Sporozoa. Thus the mosquitoes (*Culicidae*) carry *Plasmodium*, *Laverania*, *Proteosoma*, and *Trypanosoma*; the horse flies (*Tabanidae*) and tsetse flies (*Glossina*) carry *Trypanosoma*; louse flies (*Hippoboscidae*) carry *Trypanosoma*, *Hemoproteus*, and *Leucocytozoon*; the sand flies (*Phlebotomus*) carry *Leishmania*; the fleas (*Aphaniptera*) carry *Trypanosoma*, and the Hemiptera (*Triatoma* or kissing bugs) carry *Trypanosoma* and *Schizotrypanum*. Among the Arachnoidea the ticks (*Ixodidae*) carry *Babesia*, *Nuttallia*, *Theileria*, and *Hepatozoon*; and the mites (*Gamasidae*) carry *Karyolysus*, *Schellackia*, and *Hepatozoon*. Among fishes and amphibians the leeches are vectors of *Trypanosoma*, *Trypanoplasma*, and *Hemogregarina*.

This imposing list is indicative of the extent to which the evolution of blood feeding insects, arachnoids, and leeches has been attended by the evolution of protozoan blood parasites. The presence of flagellate and sporozoan parasites in the digestive tracts of non-hematophagous insects, arachnoids, and leeches suggests the derivation of the invaders of the blood stream of vertebrates from the less specialized parasites

in the digestive tract of these invertebrate hosts.

Dr. Kudicke writes of the blood flagellates. He gives an extended account of the pathogenic and non-pathogenic trypanosomes of mammals. The author is conservative in most matters of terminology and nomenclature. Thus he retains blepharoplast for the structure in the Trypanosomidae which most protozoologists, following the interpretation of the reviewer, are now calling the parabasal body. He also adheres to the old name *Lamblia* instead of *Giardia*, which clearly has nomenclatural priority and now has wide usage in all leading treatises on protozoology.

The subject of African human sleeping sickness is treated by Dr. Mense. He discusses the remarkable history of this dread plague of tropical Africa, tracing it from the Hebrew records to its present flare along streams and shores of lakes from Senegal into Angola, and from the Soudan into Rhodesia. It varies considerably in virulence, in intensity of infection, and in the resulting mortality. Treatments by arsenicals, including the trypanosamide and the German 205, or germanin, are not certainly successful and often fail in advanced cases of the disease. But the victim of this dread infection need not in the early stage, as formerly, look forward to a fatal termination.

The author holds as inconclusive the evidence that the wild game of Africa is widely infected with the human trypanosome, and refrains from advising its extermination as a protection to man in endemic areas of trypanosomiasis.

The volume is notable in scope and treatment, and maintains the well known high standard of illustration, documentation, editorial coordination, and scholarly thoroughness which has always characterized this work under the capable leadership of the veteran

investigator of tropical diseases, Professor Dr. Carl Mense. It is a fine contribution to this active field of medical investigation.

C. A. KOFOID

Personal and Public Health—By Burkard, Chambers and Maroney. New York: Lyons and Carnahan, 1930. 516 pp. Price, \$1.08.

This text, intended for junior high schools, uses the very logical but rarely found method of presenting the closely related personal health facts in closely related style. This is the outstandingly good feature of the book. As a result the chapter on The Muscular System, for example, includes the related facts of anatomy, physiology, nutrition, general hygiene, safety, and first aid; that on Teeth, their structure and development, the importance of diet in relation to fine sound teeth, personal and dental care; and teeth as focuses of infection. The use of more than 4 pages for presenting various methods for brushing the teeth rather spoils the emphasis on the relation of nutrition to fine teeth, and raises a question as to the confidence of the authors in the effectiveness of the health habit material presented in the first books of their series.

The community health facts are presented in such a way that the more abstract ones relating to federal and state precede the more concrete home, school, and local community health facts. The suggestions for Health Habit Formation are practical but any challenge to the pupils will have to be supplied by the teacher or the children themselves.

The mechanics of the book leave something to be desired from a health standpoint since the various sizes of type break up the pages in a way to irritate even the untrained eyes of a child. The English also leaves something to be desired in that the almost constant use of simple sentences is

monotonous; for example, "The arms and legs are joined so that they act as levers," and "There are four curves in the spinal column as viewed from the side."

MARY L. HAHN

Health and Life—Consultations with Eminent Doctors. Edited by Morris Fishbein, M.D. Chicago: Manning Publ. Co., 1931. Set of 8 volumes. Price, \$4.00, \$.50 each.

Here is a new series of attractive little books on health, written by eminent physicians in conversational style so as to appeal to a wide popular audience. These should prove helpful on the table in the waiting room of the busy practitioner. They should also find a place in the hands of teachers, nurses, and health educators.

They will do much to strengthen the growing opinion that physicians are instructors in health as well as in curing disease, and that they are glad to take the public into their confidence on all important matters concerning personal hygiene.

Incidentally, these volumes will act as an antidote to much of the hurried, ill-digested and erroneous material put out in the name of health education at the present time.

It is not possible to give consideration to each individual volume. The soundness of the content is guaranteed by the reliability of the authors of each chapter.

RICHARD A. BOLT

An Exhibition Handbook—By Randall D. Warden. New York: Barnes, 1929. 107 pp. Price, \$1.00.

The first thing to recommend this book is its practical usefulness to any department of physical education. The public is usually entertained by well presented exhibitions of this type. The Handbook sets forth a program for such an exhibition together with detailed directions for putting it on. In addition to being an interesting program it will

give any school patron a very good idea of the sort of work the department is doing. Free exercises, those demanding a fair equipment of apparatus, tumbling, and dancing, make it possible to give every group a chance to display its proficiency. The last pages are given over to an out-of-door festival with full directions for its presentation.

LENNA L. MEANES

Wholesome Living Series: Health and Happiness; Health and the Rules of the Game; Health and Control; Health and Service—By Jesse Feiring Williams and Theresa Dansdill.

Health and Ideals—By Jesse Feiring Williams. Boston: Benj. H. Sanborn & Co., 1930–1931. Price, \$.64, \$.64, \$.68, \$.72, and \$.80.

In this series for textbook use in public schools from the 3d grade up to and through junior high, the subject of health, as the title indicates, is treated as a trinity of physical, mental, and social well-being. No part of this trinity can be at its best without the best of health in all three. Health education therefore becomes, not just a matter of instruction in hygiene—or not of that plus instruction in public health measures—but rather a matter of correlating health with all life. The rules of the health game are made imperative in playing the whole game of living with one's group—living it as the boy or girl wants to live it as a well trained, fit member, able to take his own part, able now and then to lead.

The first of the series—for use in the 3d grade—called *Health and Happiness*, and the second—*Health and the Rules of the Game*—for 4th grade, are both collections of attractive stories for children, each introducing some simple but vital phase of health activity and nailing the lesson down by questions supposed to be asked by a child of the story and really asked by a group of

children in trying out the material for use in the book. These two of the five are illustrated in color by Alexander Key.

Health and Control and *Health and Service* follow for the 5th and 6th grades. These are more formal in plan, taking on chapters and general textbook arrangement, but show a skillful handling so that facts in health living are made live, vital, to be used in making oneself a desirable member of a group. Illustrated in black and white.

Health and Ideals is planned as a text for 7th and 8th grades; particularly its manner of presenting the physiological material—really very comprehensive and technical—is adapted to appeal to the motives common to adolescents, ranking high among which is the desire to be well trained like the athlete of the school, to be a good fellow in playing the game, and to be fit to meet any great adventure that may come along. Technical drawings by T. M. Stell, others by Alexander Key.

LENNA L. MEANES

Practical Massage and Corrective Exercises with Applied Anatomy
—By *Hartvig Nissen*. Boston: Davis, 1929. 271 pp. Price, \$2.50.

As student, teacher, and masseur from the Swedish school, Nissen brings his experience and knowledge to the public in a clean-cut, practical fashion, which puts massage in its proper place in relation to all exercise. The author gives us the why and the what and the result of manipulations in the first section of his book. He follows by doing the same for corrective exercises. While by no means claiming that exercise is a cure for all ills, he does, in the last division, make an intelligent claim for it in many instances. The book is blessed with a very comprehensive table of contents and an adequate index. In addition it is well set-up so as to make its reading attractive. The 72 illustrations

—half tones and line engravings—are excellent.

LENNA L. MEANES

Margarine as a Butter Substitute—
By *Katharine Snodgrass*. Stanford University, Calif.: Food Research Institute, 1930. Price, \$3.00.

Prepared under the Directors of the Food Research Institute, who have also contributed certain sections to it, this volume is an illuminating study of oleo-margarine from its introduction to the present. The processes of manufacture are described, and the materials used mentioned and discussed. Naturally, developments in the butter industry had also to find a place, and several chapters are given to a consideration of the butter and margarine markets. The various vegetable oils, their sources, production, purification, and uses, come in for treatment. The economics of the situation are considered, and some 9 chapters are given to legislative enactments, in addition to which there are 2 appendixes which give summaries of federal and state legislation.

The volume strikes us as being an impartial and comprehensive study. This feature is brought out particularly in "Concluding Remarks," where the material is summed up under 2 heads, for margarine on the one hand, and butter on the other. It is stated clearly that there is truth in the claims of both sides. Involved in the controversy, there is also the question of vegetable oils, some, such as cotton seed, peanut and corn, produced in this country, some in our dependencies, like the Philippines, and some in foreign lands. The economic aspect is given full attention. One must read the book to get a clear idea of the complexity of the situation, and the various interests which are involved. The only persons who seem so far to have been left out of consideration are the consumers, a fact upon which the author comments.

It seems clear from the text that politics has played a large part in the controversy, and it will probably come as a surprise to many to be told that the question of independence of the Philippine Islands is involved, since at present they are able to import coconut oil free of duty, in competition with American producers who refine the oil from copra.

There are numerous charts and tables taken from governmental sources, showing relative consumption, production,

export, prices, number of milch cows, and other data bearing on the matter.

The book can be thoroughly commended to all who are interested in this question, which has been discussed for many years, and has given rise to much bitterness.

The printing and make-up of the book are excellent. The author has had assistance of the Directors of the Food Research Institute, as well as a number of experts in various parts of the country. M. P. RAVENEL

BOOKS RECEIVED

- THE PRINCIPLES OF EPIDEMIOLOGY AND THE PROCESS OF INFECTION. By C. O. Stallybrass. New York: Macmillan, 1931. 696 pp. Price, \$8.50.
- PREVENTION OF DISEASE IN THE COMMUNITY. By Curtis M. Hilliard. New York: McGraw-Hill, 1931. 193 pp. Price, \$1.75.
- CANCER AND SCIENTIFIC RESEARCH. By Barbara Holmes. New York: Macmillan, 1931. 160 pp. Price, \$1.50.
- MOTHER ALPHONSA. By James J. Walsh. New York: Macmillan, 1930. 275 pp. Price, \$2.25.
- DIFFERENTIAL MORTALITY IN TENNESSEE. By Elbridge Sibley. Nashville: Fisk University Press, 1930. 152 pp. Price, \$2.50.
- LABORATORY DIAGNOSIS. By Edwin E. Osgood and Howard D. Haskins. Philadelphia: Blakiston, 1931. 475 pp. Price, \$5.00.
- STUDIES FROM THE DELAMAR INSTITUTE OF PUBLIC HEALTH. Columbia University Reprints, 1928-1930. Vol. IV. New York: Delamar Institute of Public Health, Columbia University, 1931. 560 pp.
- FACTS AND FIGURES ABOUT TUBERCULOSIS. Compiled by Jessamine S. Whitney. New York: National Tuberculosis Association, 1931. 63 pp. Price, \$.75 paper cover, \$1.00 flexible fabrikoid.
- FARM CHILDREN. An Investigation of Rural Child Life in Selected Areas of Iowa. New York: Appleton, 1930. 337 pp. Price, \$4.00.
- PRACTICAL DIETETICS, WITH REFERENCE TO DIET IN HEALTH AND DISEASE. 18th Ed. Mount Vernon, N. Y.: Pattee, 1931. 856 pp. Price, \$2.75.
- SOME BITING REMARKS FOR THOSE WHO ARE CONSTANTLY HUNGRY. By Happy Goldsmith. New York: Barnes, 1931. 43 pp. Price, \$.75.
- SAFETY EDUCATION. By Idabelle Stevenson. New York: Barnes, 1931. 157 pp. Price, \$1.00.
- WHITE HOUSE CONFERENCE: 1930. Addresses and Abstracts of Committee Reports. Prepared by the White House Conference on Child Health and Protection. New York: Century, 1931. 372 pp. Cloth, \$2.00; Boards, \$.50.
- THE SIGHT SAVING REVIEW. Vol. I, No. 1, March, 1931. New York: National Society for the Prevention of Blindness, Inc., 1931. 80 pp. Subscription price, \$3.00 per year.
- FOOD POISONING AND FOOD-BORNE INFECTION. By Edwin Oakes Jordan. Chicago: University of Chicago Press, 1931. 286 pp. Price, \$2.50.
- THE VITAMINS. 2d ed. By H. C. Sherman and S. L. Smith. New York: Chemical Catalog Co., 1931. 575 pp. Price, \$6.00.
- PERSONAL PROBLEMS FOR MEN AND WOMEN. By Karl M. Bowman. New York: Greenberg, 1931. 279 pp. Price, \$3.50.
- DISCOVERING OURSELVES. A View of the Human Mind and How it Works. By Edward A. Strecker and Kenneth E. Appel. New York: Macmillan, 1931. 306 pp. Price, \$3.00.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Racine, Wis.—The 1930 report for this city of 67,515 opens with a graphic presentation of population, birth and death rate trends, followed by an organization chart of relationships of official and voluntary health activities. The central family file inaugurated by the health department in January, 1929, contains almost 13,000 records, including most of the families in the city. An infant mortality rate of 39.4 and a neonatal rate of 27.2 are recorded. The tuberculosis rate was 57.7 and the general death rate 9.8. The 1931 budget was \$44,045.

Through the coöperation of various organizations, a preschool campaign resulted in the examination of 796 children, or 49 per cent of the entering group. Radio talks given by the health commissioner numbered 41. Pamphlets distributed numbered 74,719. The total number of children receiving toxin-antitoxin was 1,871, of whom 69.5 per cent were less than 5 years of age. During a 5-year campaign, 11,315 children have been thus protected. Of 5,143 children given subsequent Schick tests, 95 per cent gave negative reactions. As usual, this report abounds in enlightening statistical tables and interesting descriptive text.

Henderson County, Ky.—The personnel of the full-time unit consists of a staff of 5, to serve an area of 450 square miles with a population of 26,600 in 1930. There are 25 practising physicians in the county, 18 of whom reside at the county seat. An estimate by the County Farm Agent of the effect of the drought on crops was as follows: about 20 per cent reduction in the tobacco acreage, 70 per cent damage to corn crop, and 75 per cent damage to hay and pastures. The Public Welfare Association of Henderson received

nearly 3 times as many applications for assistance in 1930 as in 1929.

There were 515 live births in the county in 1930, 82 being colored. A death rate of 12.7 is reported, based on 336 deaths. An infant mortality rate of 68 is recorded. There were 24 deaths from tuberculosis. Throughout the year, popular education through talks, bulletins and personal interviews was developed in tuberculosis control. A sign board 6' x 8' was constructed by the health department and placed in the court house yard, bearing in large print a message of warning against tuberculosis. From seal sale funds a tuberculosis hut, 8' x 10', was built for a male tuberculosis patient. Photographs of these activities illustrate the report.

The major part of the health department work was devoted to school hygiene. A Blue Ribbon campaign was inaugurated, culminating in a May Day celebration. During the year 1,921 physical defects of school children were known to have been corrected.

Pennsylvania—The 1929 Year Book indicates for the state a birth rate of 19.1 and a death rate of 11.9. The typhoid death rate of 1928 was 2.0, indicating a continuous decrease over a period of years due in large measure to the safeguarding of public water and milk supplies. The diphtheria rate in 1929 of 6.8 is the lowest recorded. The tuberculosis death rate was 63, a reduction from 151 in 1906. Detailed statistical tables are submitted by counties, and several graphs indicate mortality trends.

A system of cross-checking of fatal reportable diseases begun in 1926 led to measures which stimulated the reporting of cases. During the past 8 years the department has supplied sufficient

diphtheria toxin-antitoxin to protect over 800,000 children. "Pennsylvania has a vaccinated population, thanks to the beneficent action of the Legislature in passing a law requiring the vaccination of school children."

The bureau of milk control promotes the distribution of a clean, safe public supply and an increase in milk consumption. State department activities include farm inspections (2,020), plant inspections (483), and special tests. The state is divided into 8 districts for supervision purposes and the control officers live in their respective areas.

The bureau of child health, organized in 1923, brings under one administrative head the preschool, school, and dental work of the department. The school division reports 269,161 pupils examined and 199,821 pupils advised on treatment during the last school year. During the summer months, motor units were sent into the rural sections for the examination of infants and preschool children.

Detroit, Mich.—The January issue of *City Health* is devoted to the annual report of 99 pages under the title "1930 Our Healthiest Year." Excellent graphs, photographs and statistical tables accompany enlightening descriptive text.

Among the outstanding points of health interest listed are a death rate of 9.2, an infant mortality rate of 65.3 as compared with 104.2 in 1920, an increase in hospital beds for tuberculosis to 2,088, a tuberculosis death rate of 82.5, the immunization of 57,000 children against diphtheria by the private physicians of the city, and a reduction in the diphtheria death rate to 10.9, or one-half of the 1929 rate. A series of weekly clinical conferences on communicable diseases was held at the Herman Kiefer Hospital under the auspices of the public health committee of the Wayne County Medical Society.

The average attendance exceeded 225 physicians.

The department of health personnel of 1,834 is given in a classified table according to functions. A financial tabulation shows gross expenditures of \$3,962,870, with credits of \$1,825,000. Preventive medical service expenditures amounted to \$1,585,230 in this city of 1,585,653 population.

The milk inspection division pictures the monthly milk supply in terms of a lake of milk $2\frac{1}{2}$ feet deep, $\frac{1}{2}$ mile long, and over 100 yards wide, weighing over 30 million pounds. Milk supervision is organized from the point of production to the time of delivery. There are 14,600 farms, 30 pasteurizing plants, the former receiving 17,880 inspections and the latter 4,473 inspections during the year.

All food handlers must possess an annual card issued by the department of health, indicating that they have had, during the year, a complete physical examination. Such examination may be made by any reputable licensed physician or by the department. As a means of making the physical examination of more personal value to the individual, all food handlers appearing for examination at clinic are given elementary talks on personal hygiene while they are waiting for examination. In 1930, 13,818 examinations were given, of which 8,448 were by private physicians.

The child health service of the department of health was previously reviewed in this column. The Board of Health has described the educational functions of the public health nurse as follows: (a) prevention of illness; (b) measures to be carried out to secure the alleviation of sickness; (c) social service matters which involve proper hygiene in the home—this may involve such budgetary management of income that the nutritional requirements of the family may be adequate; (d) child hygiene; (e)

applied psychology; (f) a knowledge of welfare agencies which are available, together with the aid they can render; (g) a sound theory and practice of rest, exercise, food, raiment, cleanliness, and how inciting agents are spread; (h) laws, regulations, and procedures for preserving the public health. With these functions in mind, the board has set up qualifications for the nurses of the department.

Winona, Minn.—Pasteurization is required of all milk sold in this city. Coöperation between milk producers, distributors, and the department of health has resulted in the stabilization of milk prices. The producers receive 60 per cent of the retail price and the distributors 40 per cent. Milk purchased from the producers is on a flat rate, the minimum butter fat content being 3.5 per cent. The consumer pays 11 cents a quart for standard milk equivalent to Grade A pasteurized, which is produced from cows tuberculin tested annually under the federal and state accredited herd plan and physically examined quarterly.

This city, with a population of 35,144, reports for 1930, 241 deaths, 429 births (265 in hospital, 15 attended by midwives), with 16 deaths under 1 year of age. The average length of life of residents, excluding infant deaths, was 60 years. There were 7 deaths from tuberculosis, with no deaths from diphtheria. Attendance at infant welfare clinics numbered 1,522, while home visits totalled 1,678. This report of 22 pages is written in a popular style worthy of commendation.

Palo Alto, Calif.—Palo Alto's annual report for 1930 was off the press on February 28—an excellent record. To be of greatest usefulness, early publication of annual reports is desirable. On the basis of a population of 13,800, a death rate of 9.6 is recorded. Eight

of the 15 deaths from tuberculosis recorded were of persons over 63 years of age. The infant mortality rate was 39.2, as compared with 41.3 for the preceding 10-year period. There were 37.6 cases of communicable diseases reported per 1,000 population.

Milk consumption has reached 1.2 pints per capita. Two surprise milk tests were made of the local milk supply by representatives of the State Department of Agriculture, and a general average score of 97.8 was obtained. Palo Alto received honorable mention in the 1929 health conservation contest of the U. S. Chamber of Commerce. There have been no deaths in the city from diphtheria since 1921. Active immunization was carried on as in former years, 420 children having been protected by local physicians and the health department.

Steubenville, O.—A vaccination campaign in 1930 resulted in the vaccination of 1,156 persons, including 29 adults. A subsequent survey showed 66 per cent of the 7,360 school children protected. There was 1 case of small-pox during the year. At the preschool clinic there was an attendance of 167. Of 2,766 school children Schick tested, 1,128 were found to be susceptible to diphtheria and 500 of these were immunized. The immunization campaigns were conducted with the coöperation of the local medical association.

The milk supply is obtained from 490 dairy farms in 5 adjoining counties. Pasteurization safeguards 85 per cent of the supply. Inspections are made of farms and pasteurizing plants. A modern milk ordinance was passed in 1929.

Vancouver (B. C.) Hospital Survey—A comprehensive report has been issued by the Vancouver hospital survey commission upon the hospital situation of greater Vancouver, conducted under the auspices of a joint committee

of the city council, the hospital board of directors, and the provincial government of British Columbia. The report is of 220 pages with 8 chapters and an appendix. Several charts and a topographical map add interest to the report, which deals with public health and welfare activities, as well as hospitals.

A metropolitan hospital plan is suggested, which includes the organization of a central laboratory for all institutions, with a small subsidiary laboratory in each hospital. It is suggested that the laboratory work of the health department be conducted in this central laboratory as at present. The commission favored the complete separation of all medical functions from the city relief department and their transfer to the outpatient department of the general hospital. It further suggests that the relief department under the direction of an experienced sociologist, confine its activities to material relief, unemployment, and community sociological projects.

A staff qualifications committee is proposed as an aid in selecting competent physicians for the hospitals. Two complete but separate attending staffs are suggested, each serving for a period of 6 months. By this time, it would be possible to compare each department with the corresponding department on the other service; it would also offer a wider opportunity to the medical profession, and the burden of charity work would not fall too heavily upon the shoulders of a small group.

It is suggested that private hospitals be placed under the inspectorial super-

vision of a Metropolitan Hospital Board, and that all future expansion programs be subject to the approval of that body. It is also recommended that the licensing of private, commercial hospitals be delegated to the proposed Director General of Hospitals of the Metropolitan Board. Fundamental standards for the conduct of an outpatient department are outlined. Emphasis is placed upon the need for a first class social service department staffed with experienced and well trained workers. A new institution is suggested for the care of chronic and convalescent cases.

Iowa—The biennial report for the period ending June 30, 1930, shows that the state-wide diphtheria immunization campaign has resulted in the protection of about two-thirds of the school children. Credit is given to the protection thus conferred for the reduction in deaths from a yearly average of 242 for the period preceding the campaign (1923) to 34 for the year 1929. There were 4,969 cases of smallpox reported, causing a calculated loss of time through quarantine of 382 years. The tuberculosis death rate in 1929 was 33. The epidemiologist's report contains a detailed account of severe epidemiological investigations of interest.

Considerable public health education work has been done. More than 200 letters and 2,500 pieces of second class mail leave the department daily, and a weekly health message on timely subjects is published. The health message topics are widely copied by newspapers throughout the state.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Antiseptic Standards—Justly critical of the old methods of evaluating antiseptics, a new and complete survey of antiseptic qualities is advocated.

ALLEN, A. W., and WRIGHT, I. S. Determination of the Value of Antiseptics, *J. A. M. A.*, 96, 12: 920 (Mar. 21), 1931.

Coal Miners' Lungs—A radiographic study of industrially healthy miners reveals extensive lung alterations which represent a definite impairment of lung structure and function, yet are consistent with working health.

ANON. Coal Miners' Lungs, *J. Indust. Hyg.*, 13, 1: 19 (Jan.), 1931.

Public Health Law Fundamentals—Adequately described in the title. Good for the soul of the law enforcing officer.

BAUMAN, J. E. The Fundamentals of Public Health Law, *Pub. Health Rep.*, 46, 12: 631 (Mar. 20), 1931.

National Diets—This scholarly dissertation on diet goes deeper than calories of carbohydrates and proteins and considers the more fundamental and potent factors that influence the national dietary.

CATHCART, E. P. The Foundations of a National Diet, *Med. Off.*, 45, 12: 131 (Mar. 21), 1931.

The Future Physician—"Within certain limits, therefore, the physician of the future will be able to control the growth of the body and the development of the mind. He will acquire such a knowledge of biochemical and biophysical processes that he will be able to guide his fellow men as an engineer of living processes."

CRILE, G. W. The Medicine of the Future,

New York State J. Med., 31, 5: 272 (Mar. 1), 1931.

Tolerance to Staphylococcus "Poisoning"—Human subjects fed increasing doses of staphylococcus filtrates developed some tolerance to "food poisoning" produced by the strain.

DACK, G. M. Attempts to Immunize Human Volunteers with Staphylococcus Filtrates that are Toxic to Man when Swallowed, *J. Prev. Med.*, 5, 2: 151 (Mar.), 1931.

Progress of Clinics—The tendency of clinics to expand in number and scope and to become centers of medical service rather than charitable enterprises leaves many problems for the medical profession to solve. The discussion of these problems becomes a most interesting paper.

DAVIS, M. M. What the Public Has a Right to Expect of Clinics, *New Eng. J. Med.*, 204, 12: 604 (Mar. 19), 1931.

Fostering the Unfit?—An eloquent answer to the dimwit who cries out against our modern health measures on the ground that we are fostering the weakling.

EMERSON, H. Are We Fostering the Unfit? *Survey Graphic*, 46, 1: 49 (Apr.), 1931.

White House Conference Continued—The final session of the President's Conference on Child Health so rich in fact finding, but about which there was so little public acclaim, is briefly summarized.

EMERSON, H. The Child Takes the Lead, *Survey*, 65, 12: 649 (Mar. 15), 1931.

Epidemic Poliomyelitis—In readily understandable form, this excellent statement of the present status of our knowl-

edge of poliomyelitis is a good example of "how it should be told."

HEKTOEN, L. Infantile Paralysis, *Pub. Health Nurse*, 23, 3: 114 (Mar.), 1931.

Tonsils, Adenoids and Infections—A 10-year study of 4,400 controlled children indicates that removal of tonsils and adenoids favorably influences the incidence of colds, sore throats, rheumatic fever, diphtheria, scarlet fever, nephritis. Chorea, measles, laryngitis and tuberculosis seemed to be improved to a slight degree. But bronchitis, pneumonia and sinusitis were influenced unfavorably.

KAISER, A. D. The Relation of Tonsils and Adenoids to Infections in Children, *Am. J. Dis. Child.*, 41, 3: 568 (Mar.), 1931.

Telling Dear Public—One of the best examples we have seen of a story about health work by a practising sanitarian. If more of them would go and do likewise, many more people would know what public health really is.

LAYBOURN, R. L. Laboratory Specimens, *Survey Graphic*, 65, 11: 607 (Mar. 1), 1931.

State Health Survey—This survey of the health administration needs of Oklahoma contains much that may be applied to state administration generally.

McLAUGHLIN, A. J. A Public Health Survey of Oklahoma, *Pub. Health Rep.*, 46, 11: 575 (Mar. 13), 1931.

Tuberculosis in Children—A plea for early institutional treatment to check tuberculosis in children, to prevent the greater part of the deaths from the disease in adult life.

McPHERDAN, F. M. Some Aspects of Tuberculosis in Children, *Brit. M. J.* 3660: 342 (Feb. 28), 1931.

Venereal Disease Reporting—Approximately 1,000 physicians, or less than a third of the number who saw venereal disease patients, were responsi-

ble (with public clinics) for more than 11,000 Massachusetts case reports in 1930. The study of these reports leads to interesting conclusions.

NELSON, N. A., and SCAMMAN, C. L. Gonorrhea and Syphilis in Massachusetts in 1930, *New Eng. J. Med.*, 204, 13: 637 (Mar. 26), 1931.

Diphtheria Toxoid—This description of the preparation and dosage of toxoid explains the probable reason for some of the conflicting reports of early experience with the product which will eventually replace toxin-antitoxin mixture for routine immunization of small children against diphtheria.

POVITZKI, O. R., *et al.* Diphtheria Toxoid, Preparation and Dosage, *J. Immunol.*, 20, 3: 247 (Mar.), 1931.

Diagnosis of Tuberculosis—Of a group of persons applying for employment, 1.2 per cent had X-ray evidence of tuberculosis without other physical signs. More than half showed progressive disease within the year. This is a significant finding to be considered by health examination propagandists.

REID, A. C. X-ray Tuberculosis in Apparently Healthy Individuals, *New York State J. Med.*, 31, 6: 337 (Mar. 15), 1931.

Diphtheria Mortality—Statistical evidence of what is very generally accepted: mortality increases with delay in the administration of antitoxin; rural mortality rates exceed urban, regardless of method of treatment; mortality expectancy decreases with age.

STEVENS, I. M. An Analysis of 3,122 Diphtheria Case Histories, *Am. J. Hyg.*, 13, 2: 392 (Mar.), 1931.

Measles Diagnosis—Three aspects of measles control are discussed: the priority of fever in symptomatology; the importance of eye signs in early diagnosis; and the necessity of individual isolation.

STIMSON, P. M. Important Aspects of

Measles, *New York State J. Med.*, 31, 6: 352 (Mar. 15), 1931.

Encephalitis Following Vaccination—Three cases of encephalitis following anti-smallpox vaccination are presented in a discussion of the differences between this condition, encephalitis lethargica, and tetanus.

VIETS, H. R., and WARREN, S. Vaccinal Encephalitis, *New Eng. J. Med.*, 204, 10: 475 (Mar. 3), 1931.

Intradermal Typhoid Vaccination—Injections of four small doses of anti-typhoid vaccine intradermally are suggested on the ground that the technic is simple, the immunologic response is satisfactory, and local reaction is much reduced.

TUTT, L. Active Immunization Against Typhoid Fever, with Particular Reference to an Intradermal Method, *J. Lab. & Clin. Med.*, 16, 6: 552 (Mar.), 1931.

Cold Vaccine—Successful but limited experience in preventing colds is reported in the prophylactic use of a vaccine comprising the more prevalent varieties of streptococci.

WALKER, I. C. Apparent Specificity Among Streptococci and the Cause of Some Failures of Mixed Streptococcus Vaccines in the Treatment of Chest Colds and Asthma, *J. Lab. & Clin. Med.*, 16, 6: 539 (Mar.), 1931.

Mental Health—Written from other viewpoints than that of the public health

officer, this series of papers still has much of interest for the sanitarian.

WILBUR, R. L., *et al.* Mental Health as a National Problem, *J. A. M. A.*, 96, 13: 994 (Mar. 28), 1931.

Rural Health Service—There are two fundamental facts: rural areas need the same health service the city gets; many cannot pay for such services. Collective responsibility presumes state aid, which is the only escape from the dilemma. The story of Cattaraugus leads to this conclusion.

WINSLOW, C.-E. A. Carrying Health to the Country, *Survey Graphic*, 65, 11: 610 (Mar. 1), 1931.

Getting Group Action—Remarks anent the new leadership as a means of stimulating creative thinking in and by a group. Addressed to a visiting nurse service board meeting, this excellent paper can be read with profit by all sanitarians.

WINSLOW, C.-E. A. The New Leadership, *Pub. Health Nurse*, 23, 3: 108 (Mar.), 1931.

Cancer Research—Absorbing indeed is this excellently prepared and brief story of 30 years of experimental study of the cause and growth of malignant disease. A wealth of material for health workers who would become publicists.

WOGLOM, W. H. Experimental Cancer Research, *Am. J. Med. Sci.*, 181, 2: 157 (Feb.), 1931.

NEWS FROM THE FIELD

SUMMER SCHOOL COURSES IN PUBLIC HEALTH

While the following list does not show all universities and technical schools offering summer courses in public health, it represents those who have replied to a questionnaire sent out by the American Public Health Association.

University of California, Berkeley, Calif.

June 22–August 1
Administration of Schools of Nursing
Elementary Epidemiology
Elementary Public Health
Public Health Nurse in Relation to the Community
Responsibility of the Public Health Nurse for the Health of the Adult
Supervision in Schools of Nursing

Columbia University—DeLamar Institute of Public Health, College of Physician and Surgeons

June 15–July 1
School Health Supervision—Medical Inspection, Mental and Physical Education

Teachers College, New York, N. Y.

July 6–August 14
Administration of Health Work in Schools
Child Hygiene
Health Care of Infants
Health Education in Elementary Schools
Home and Community Hygiene
Methods of Teaching in Fresh Air Classes
Methods of Teaching Lip-Reading
Nutrition and Health
Personal Hygiene
Principles of Public Health Nursing
Public Health Administration
Research in Child Health
Safety Education
School Nursing
Sight Saving Classes
Supervision in Public Health Nursing
Supervision of Health Education
Survey of Public Health Nursing

Cornell University, Ithaca, N. Y.

July 6–August 14
Gymnastics and Dancing

Health Supervision of School Children
Hygiene of the School Child and Adolescent

Measurements of School Children
Physical Education

Duke University, Durham, N. C.

June 12–July 22
Materials and Methods in Health Education
Materials and Methods of Physical Education

University of Georgia, Athens, Ga.

June 22–August 22
Behavior Problems in Children
Child Care and Training
Child Development
Child Study and Parent Education
Development of the Young Child
Diagnosis and Treatment of Exceptional Children
Educational Biology
Educational and Mental Hygiene
Educational Hygiene
Educational Sociology
Health Education
Mental and Educational Measurements
Physiology and Health
Play Activities
P. T. A. and Parent Education
Principles of Health and Recreation
Mental Hygiene
The Age of Adolescence
The Age of Childhood

Harvard University, Cambridge, Mass.

July 6–August 15
Principles and Problems of Hygiene, and Teaching Methods
Physical Education, Theory and Practice

University of Hawaii, Honolulu, T. H.

June 29–August 7
Health Education and Popular Health Instruction

University of Illinois, Urbana, Ill.

June 22–August 15

Health Education and Corrective Gymnastics
 Organization and Supervision of Health Education in the Elementary Schools
 Physical Education
 School Hygiene

State University of Iowa, Iowa City, Ia.

June 8–July 7 (First Term)

July 20–August 20 (Second Term)

Administration of Physical Education and Athletics
 Advanced Hygiene
 Corrective and Remedial Gymnastics
 Health Education Program in Elementary Schools
 Hygiene
 Hygiene of Swimming Pools, Gymnasiums, Camps
 Institutional Nutrition
 Medical Supervision of Athletics
 Organization, Administration and Supervision of Public Play-Grounds
 Organization, Administration and Supervision of Public Recreation
 Organization, Administration and Supervision of Public School Physical Education
 Principles and Methods of Physical Education
 Principles of Physical Growth and Measurements
 Seminar in Public Health

Johns Hopkins University, Baltimore, Md.

June 22–July 31

Elements of Hygiene and Preventive Medicine
 School Hygiene

Massachusetts Institute of Technology, Cambridge, Mass.

July 6–August 14

Bacteriology
 Health Education Methods
 Methods of Teaching General Biology
 Public Health Laboratory Methods

University of Michigan, Ann Arbor, Mich.

June 29–August 7

Administration and Organization of Public Health Nursing
 Applied Nutrition
 Child Hygiene
 Epidemiology and Communicable Diseases
 General Hygiene and Public Health

Industrial Hygiene

Medical Social Case Work

Mental Hygiene

Methods and Materials in Health Teaching

Principles of Public Health Nursing

Public Health Law and Administration

School Health Problems

Vital Statistics

Michigan State College, East Lansing, Mich.

June 2–July 31

Bacteriology

Hygiene

Medical Biology

Pathology

Physiology

University of Missouri, Columbia, Mo.

June 8–July 31

Nursing

Physical Education

School Hygiene

University of New Mexico, Albuquerque, N. M.

June 8–August 1

Educational Hygiene

New York University, New York, N. Y.

July 6–August 14

Child Hygiene

Education in Health

Health and Growth of School Children

Methods of Teaching Health

Principles of Teaching Health

Northwestern University, Evanston, Ill.

June 22–August 15

Personal Hygiene

University of Pennsylvania, Philadelphia, Pa.

July 6–August 15

Hygiene

Physical Education

Pennsylvania School of Social and Health Work, Philadelphia, Pa.

June 15–July 24

Nutrition

Public Health Nursing

School Nursing

Social Hygiene

Social Problems

Tuberculosis and Its Control

Rutgers University, New Brunswick, N. J.

June 29–August 7

First Aid
Preventive Medicine
Public Health

Stanford University, Stanford University, Calif.

June 18–August 29
Health Department Administration
Physical Education and Hygiene
Public Health Nursing

Syracuse University, Syracuse, N. Y.

July 6–August 14
Home Nursing
Hygiene

University of Virginia, University, Va.

June 22–August 1 (First Term)
August 3–September 5 (Second Term)

Biochemistry
Hygiene and Sanitation
Physical Education
Sex Character Education

University of Washington, Seattle, Wash.

June 17–July 27 (First Term)
July 27–August 27 (Second Term)
Advanced Nutrition

Bacteriology
Health Education Movement
Personal and General Hygiene
Physical Education Administration
Physical Education Methods
Principles of Physical Education
Principles of Public Health Nursing
School Hygiene
Supervision of Physical Education

Western Reserve University, Cleveland, O.

June 22–July 31
Foods and Health
Hygiene of the Child
Personal Hygiene

University of West Virginia, Morgantown, W. Va.

June 15–July 24
Health Education

University of Wisconsin, Madison, Wis.

June 29–August 7
Bacteriology
First Aid to the Injured
Supervision and Organization of Health Education
Tests and Measurements in Physical Education

PENNSYLVANIA PUBLIC HEALTH ASSOCIATION

THE Pennsylvania Public Health Association will hold its annual meeting at the Penn Harris Hotel, Harrisburg, Pa., June 18–19, 1931. Surgeon General Hugh S. Cumming has kindly consented to address the association at the dinner meeting of June 18.

FIRST BROADCAST OF HEALTH FILMS BY TELEVISION

THREE of the animated cartoons used by the Division of Public Health Education of the State Department of Health were broadcast by television through the courtesy of the De Forest Radio Company television station W2XCD, Passaic, N. J. The first film was sent out on March 30 and the other two on April 6 and 13 respectively. The hour of broadcasting in each in-

stance was 10 P.M. The films were accompanied by appropriate music, which are synchronized with the pictures.

Sight is transmitted from station W2XCD on 2,035 kilocycles while sound is transmitted on 1,604 kilocycles. The range of the station extends beyond the Mississippi River and from the Gulf of Mexico into Canada.

This broadcast is the first known attempt in history to send health films by television.

ENDEMIC TYPHUS FEVER

A REPORT recently made public by the U. S. Public Health Service shows that there is strong evidence to indicate that fleas may be the means of transmission of endemic typhus fever from person to person or from a possible rodent reservoir to human beings. This discovery is of much importance

and may be of value in the prevention of the spread of this disease.

NATIONAL SAFETY CONGRESS

EACH year during the past 18 years there has been held, somewhere in the United States, what has been called a "National Safety Congress."

These gatherings, which have gradually grown in size until they are now among the largest and best organized congresses of the world, are visible proof of the growth and importance of what likewise has been called "The Safety Movement."

The Congress this year will be the Nineteenth Annual Safety Congress and Exposition, to be held in Pittsburgh from September 29 to October 3.

SWEDEN

NEW legislation prohibiting the employment of workers less than 18 years old in certain occupations went into effect in Sweden on January 1, 1931. According to the labor law of 1912, which is still in force, the King has the authority either to prohibit the employment of persons under 18 in certain occupations or to permit it under certain conditions.—*Sociala Meddelanden*, Stockholm, 11: 872, 1930.

ROCKY MOUNTAIN SPOTTED FEVER

A DISEASE of the Rocky Mountain spotted fever type has been identified as occurring in states in the eastern and southeastern sections of the United States. Heretofore it has been thought that it existed only in the western part of the United States, being most prevalent in the Rocky Mountain section.

NEW YORK STATE SEWAGE WORKS ASSOCIATION

THE Third Annual Meeting of the New York State Sewage Works Association was held in Albany, N. Y., March 5, 1931. At the business meet-

ing W. P. Gyatt, Syracuse, C. A. Howell, Buffalo, and E. B. Phelps, New York, were elected to the Executive Committee in place of H. B. Cleveland, M. Cohn and G. D. Holmes, whose terms of office expired. John F. Skinner, Rochester, was elected President, and E. B. Phelps, Vice-President. A. S. Bedell, State Department of Health, Albany, was reappointed Secretary-Treasurer.

The next meeting of the association will be held in Freeport, N. Y., June 5-6, 1931.

PASTEURIZED MILK AVAILABLE IN JERUSALEM

THE pasteurization plant of the Straus Health Center in Jerusalem maintained by Hadassah, the Women's Zionist Organization of America, is now in operation. This means that a supply of milk, pasteurized under the most modern scientific conditions, is available in Jerusalem.

HOSPITAL CARE FOR NEGRO CRIPPLED CHILDREN

A NEW Duke memorial building for Negro crippled children was recently dedicated at the North Carolina Orthopedic Hospital, Gastonia. Its erection was made possible by a bequest for the purpose in the will of Benjamin N. Duke.

NOTICE OF THE WORLD FEDERATION OF EDUCATION ASSOCIATIONS CONFERENCE

THE fifth conference of the World Federation of Education Associations will be held at Denver, Colo., July 27-August 1, 1931. This organization seeks to coöperate with all organizations working for the advancement of world unity.

The Health Section, one of the many devoted to specific interests, has functioned actively in the promotion of school health programs. The meetings held at San Francisco, Calif., in 1923; Edinburgh, Scotland, in 1925; Toronto,

Ont., in 1927, and Geneva, Switzerland, in 1929, have been attended by representatives from all parts of the world and the reports issued by this section have an important place in libraries of teacher training institutions and in education and health administration offices throughout the world.

The program for the Health Section meeting at Denver is now being arranged and representatives of Latin-American countries will be heartily welcomed either as speakers or participants. All phases of the school health program will be presented and a representative audience of public health officers, doctors, nurses, physical educators, health educators, classroom teachers, home economists and other authorities is expected.

For further information address the secretary of the Health Section, Sally Lucas Jean, 200 Fifth Avenue, New York, N. Y.

HERMANN M. BIGGS MEMORIAL LECTURE

THE Memorial lectureship which bears the name of Hermann M. Biggs was founded by his widow. At first it was given under the auspices of the New York Tuberculosis and Health Association and the Medical Society of the County of New York. In 1930 it came under the aegis of The New York Academy of Medicine, and the first lecture as an Academy event will be given May 7, 1931.

The first lecture was delivered in 1925, by Dr. William H. Park, on "A survey of some broad phases of tuberculosis."

The other Biggs Memorial Lectures have been delivered by Dr. S. Lyle Cummins, in 1926, on "Clinical differences in tuberculosis"; Dr. Allen K. Krause in 1927, on "Tuberculosis and public health"; in 1928, Dr. C.-E. A. Winslow, who chose as his title "The contribution of Hermann M. Biggs to public health." Dr. John H. Stokes was the lecturer in 1929, speaking on

"The syphilology of today and tomorrow."

There was no lecture in 1930 and the program for this year, under the auspices of the Academy, will have as the speaker, Dr. George H. Bigelow, Commissioner of Health of the Commonwealth of Massachusetts.

EVAPORATED MILK SENT TO DROUGHT AREA

AS stated editorially in the March issue of the *Journal*, one of the most urgent needs in the drought area has been an adequate supply of pure milk. Sanitarians will be interested and gratified to learn, therefore, that in April 10 carloads of evaporated whole milk, the equivalent of nearly 350,000 quarts, were shipped to centers in Kentucky, West Virginia, Tennessee, and Oklahoma for distribution through local chapters of the American Red Cross.

This milk was donated to the Red Cross by more than 13,000 employees of The Borden Company of New York and its affiliates, who voluntarily raised a fund to purchase this milk from their own company at cost price.

This company has also donated to the Frontier Nursing Service of Kentucky about 1,000 pounds of powdered skim milk for relief purposes. This product is the equivalent of about 5,000 quarts of reliquified skim milk.

PROGRESS IN DISEASE PREVENTION

ACCORDING to the U. S. Public Health Service, the most significant advances in public health achievement have been manifested among the lower age groups. The great sanitary reforms, such as the filtration of water supplies, have remarkably diminished diseases of certain kinds among all ages and classes of persons, but the actual saving of life has been most pronounced among children, and especially little children and infants. It is for this reason that the expectation of life at

birth—that is, the average length of time that all children born at a given time will live—has increased from about 48 to about 58 years in the past 20 years.

CHRONIC SICKNESS COSTS 100 MILLION A YEAR

AT least 2 per cent of the population in New York City is constantly ill, and at least 70,000 persons in New York are continuously ill from chronic disease. Dr. Williams estimated that these individuals could ordinarily earn \$45,000,000 a year, and that it cost at least \$50,000,000 a year to care for them, so that the actual loss to the community on account of chronic illness was very close to \$100,000,000 a year.

ENGLISH SUMMER COURSES IN PARIS

THE Faculty of Medicine of Paris (the Medical School of the University) announces a series of postgraduate courses to be given in Paris, under the auspices of the Association for the Development of Medical Relations, a commission sponsored by the French Government. The work will be presented in the English language. Clinics, lectures and demonstrations will be conducted in the great hospitals of Paris, on a wide variety of topics, by eminent French clinicians. A nominal fee will be charged for each course.

Details may be secured by addressing directly Professor E. Hartmann, President of the "A. D. R. M.," Faculty of Medicine of Paris, 12, Rue de l'Ecole de Medicine, Paris (6e); or, in the United States, Dr. Frank Smithies, 920 North Michigan Avenue, Chicago, Ill.

FORMATION OF NEW SECTION OF THE CANADIAN PUBLIC HEALTH ASSOCIATION

FOR a number of years the need has been felt for a definite section of the association to be devoted to Public Health Engineering. As a result of the

expressed desire of a large and very representative group of engineers, the association has approved of the formation of this new section.

For the first year the officers of the association are as follows: *Honorary Chairman*, W. J. Bell, M.B., Deputy Minister of Health, Ontario; *Chairman*, George H. Ferguson, Dept. of Pensions and National Health, Ottawa; *Vice-Chairman and Secretary*, Albert E. Berry, C.E., Ph.D., Parliament Bldgs., Toronto. The plans for the Section including details of membership and appointment of committees will be presented at the first meeting of the Section, which will be held at Regina in June in the course of the annual meeting of the association.

There is every reason to believe that the new Section will prove a source of real strength to the association in its work of advancing public health in Canada.

PENNSYLVANIA'S RURAL HEALTH BUSES

THE Pennsylvania Department of Health, for six successive years, has sent to the rural sections of the state, motor cars fully equipped for the health examination of infants and young children. During the summer of 1930 it sent 2 cars to certain counties in the eastern part of the state, each car having a staff of 2 physicians, 2 dental hygienists, and 2 nurses. The cars were driven by medical students specially trained to give vision tests to 5 and 6 year old children. Over 8,000 children were examined, and 3,426 were referred for treatment to the family physician. Between 6,000 and 7,000 children had their teeth cleaned, and over 4,000 were recommended for treatment to local dentists.

PREVENTION AND CONTROL OF VENEREAL DISEASES

DURING the fiscal year 1930, state health authorities reported to the

U. S. Public Health Service 213,309 cases of syphilis and 155,875 cases of gonorrhea. The total of venereal infections thus reported exceeded the number of cases recorded during the calendar year for any other single communicable disease, omniprevalent measles not excepted. Data obtained from prevalence studies which have been made up to the present time appear to show that the incidence of syphilis and gonorrhea in the United States probably is much higher than that indicated by the state reports.

Estimates worked out from the results of these surveys place the prob-

able number of new infections for which treatment is sought during the course of a year at more than 1,000,000.

PURCHASE OF HAMILTON LABORATORY BY THE GOVERNMENT

FEDERAL purchase of the tick fever laboratory at Hamilton, Mont., has been authorized by Congress. This carries an appropriation for enlarging the building. It is expected this laboratory will be considered the western branch of the National Health Institute. The passage of this bill was a direct result of the splendid teamwork of the various health agencies of the country.

PERSONALS

ROBERT ALSTON MARTIN, M.D., Fellow of the A. P. H. A., for 32 years Health Officer of the City of Petersburg, Va., died April 1, 1931.

DR. FRANCIS M. MCCALLUM, of Kansas City, Mo., was elected president of the Missouri State Board of Health, January 26; Dr. Horace W. Carle, of St. Joseph, was elected vice-president; and Dr. James Stewart, of Jefferson City, secretary, was re-elected.

DR. GEORGE K. PRATT, of New York City, a nationally known psychiatrist, has been appointed Medical Director of the Mental Hygiene Committee of the State Charities Aid Association. Dr. Pratt, who, for the past six years, has been the Assistant Medical Di-

rector of the National Committee for Mental Hygiene, will serve in this new position on a part-time basis, and will also actively continue his staff connection with the National Committee.

ANNA GARLIN SPENCER, educator, author, theologian, humanitarian, social worker, and advocate of world peace, died February 12, 1931, at her home in New York. Dr. Spencer was Vice-President of the American Social Hygiene Association.

WILLIAM A. HAMANN, after almost half a century in the chemical manufacturing industry, recently retired as chairman and director of the Roessler & Hasslacher Chemical Co., Inc., New York, N. Y.

CONFERENCES

May 5-6, National Conference on College Hygiene, University of Syracuse, Syracuse, N. Y.

May 11-14, National Tuberculosis Association, Syracuse, N. Y.

May 28-30, Western Branch, American

Public Health Association, Seattle, Wash.

June 1, New York State Association of Public Health Laboratories, Syracuse, N. Y.

June 1-4, American Federation of Or-

American Journal of Public Health

and THE NATION'S HEALTH Vol. XIII No. 6

Volume XXI

June, 1931

Number 6

View of Health and Disease Based on a Rise and Fall in the Levels of Life with Cycles in Vitamin Tides*

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Cleveland, O.

VARIATIONS in susceptibility and resistance to disease have long been recognized as of paramount importance in determining individual health levels. The controlling factors for these variations have been but little understood, and prophylactic procedures have not been able to diminish materially the rate of apparent increase in diseases of the heart and circulatory system, and those of some other organs.

As an approach to the presentation of some new data I would suggest the viewpoint, at least for this consideration, that instead of individuals dying chiefly at this time from degenerative diseases we think of them as getting the degenerative diseases in many instances because they are in the process of dying.

This immediately raises the question as to why they are in the process of physical degeneration or death. It apparently is not simply a case of the running down of a physico-chemical mechanism since we have a series of cycles of degeneration, and when we compare the characteristics of the mortality and morbidity curves throughout a series of annual seasons we find that in various parts of the world there is remarkable constancy in the nature of the curves. This will be seen clearly in Figure I, which presents curves for mortality rates for pneumonia and heart disease for the United States, England and Wales, and New South Wales (Australia), for comparison. The similarity will immediately be seen to be most striking whether reading across the page or up and down. There is, in general, a rise in mortality in winter and a fall in summer. Our concern is why.

* Read at a Joint Session of the Food, Drugs and Nutrition and the Child Hygiene Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

It is clear that we are dealing with a force or forces fundamental to life itself, having an expression which bears a distinct relationship to seasons. This rise and fall in the level of life has an almost endless variety of expressions. Since animal life can only exist by using as nutrition directly or indirectly organic compounds developed by plant life, and the plant can use only binary compounds which it builds into ternary and higher compounds, we will look for characteristics of the plant foods to find, if possible, factors that will be related directly and indirectly to the characteristics of the morbidity and mortality data.

In order to make the problem still more specific it seems important to study the characteristics of those products which are most efficient in maintaining both life and physical development. There are many different types of plant foods available for the sustenance of life, both on the land and in the sea, all of which go back directly or indirectly to the chlorophyll of plant life.

It is of particular significance that the great group of the animal kingdom constituting the mammalia are characterized by their dependence upon milk for a period of growth in early life. We have in this fluid the only single food capable of sustaining life and growth, and a product that is remarkably uniform, regardless of the species from which it is obtained. Since milk contains the essentials for life and is the product of plant life, it may and probably does contain expressions of variation in those controlling factors which are involved in the rise and fall in the levels of life, for it contains the elements which maintain life.

The products of the pasture must contain essentials for life, both mineral and accessory, and since so many varieties of plant life can provide the requirements for milk, we probably have in milk the best index for studying these requirements in fluids.

The last two decades, and particularly the last few years, have rapidly increased our knowledge of the accessory food factors—those obscure products which make the difference in the levels of life, for when they are decreased below a certain minimum life cannot exist. These activators or vitamins may be divided into two groups, the water soluble and the fat soluble; while both are essential and both are subject to fluctuations, our chief emphasis in this review will be centered on the group which is most difficult to obtain, namely, the fat soluble vitamins. Contrary to the general conception, the sources of some of the fat soluble vitamins and activators are actually very restricted. Being fat soluble, they are found only in the small amount of fat that is present in growing plants and in certain of the fats of animals, chiefly stored there from plant life.

COMPARISON OF VITAMINS A AND D IN BUTTER BY MONTHS FOR THREE YEARS, 1928, '29, AND '30.

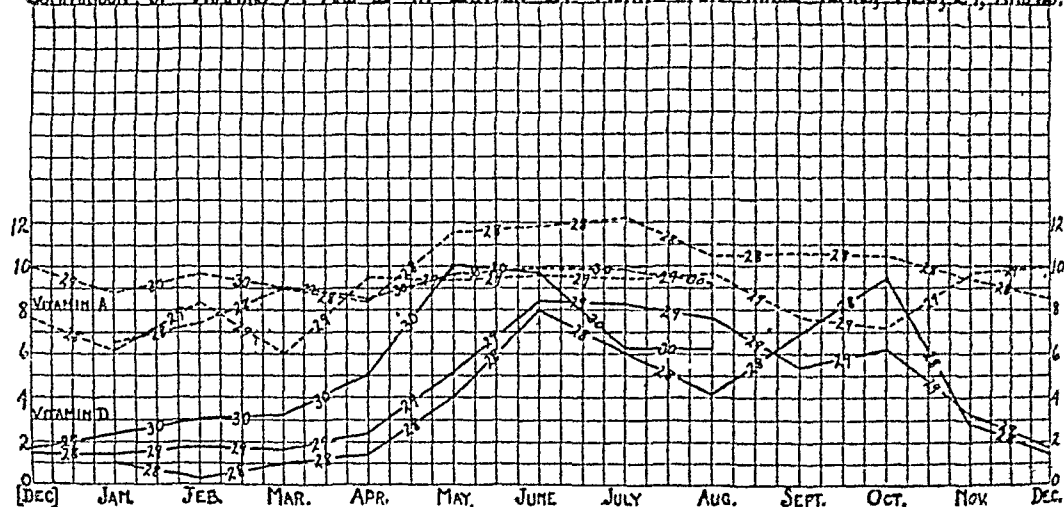


FIGURE II—Average levels of vitamins A and D for a 5-state area

It now seems probable that the principal reason milk is the infant food of so large a group of the animal kingdom is because the parent is able to take these fat soluble factors from plant life, or from the tissues of animals in which they have been stored, and make them available in the suspended fat of the breast food. The variations in mineral content of milk produced under varying conditions are found to be very much less than those in both the water soluble and fat soluble activators, both of which are essential. We are, however, primarily concerned with the variations in the fat soluble vitamins. The fat soluble activators which are chiefly responsible for mineral utilization are found in large quantities in only two important sources of food, the fat of some milk and the oils of some fishes.

Since mineral utilization is essential for the building and maintenance of all tissues of the body, particularly the bones and teeth, we are led at once to place great importance on those activating substances without which the minerals, though present, are not available for the animal body.

I am carrying out an extensive investigation on the variations in the levels of these activating substances in the fats of milk. This involves a study of the level of the fat soluble activators in dairy products as obtained from many countries throughout the world. Samples are being received from countries in both Northern and Southern Hemispheres, regularly monthly, weekly or every 2 weeks. The Alaska products include reindeer milk, butter and cheese, beside marine-life oils. The number of butter and cream samples received during the summer season this year reached 700 per month. It is ex-

ceedingly significant that there is evidence of a seasonal cycle in practically all of the countries of the world so far studied.

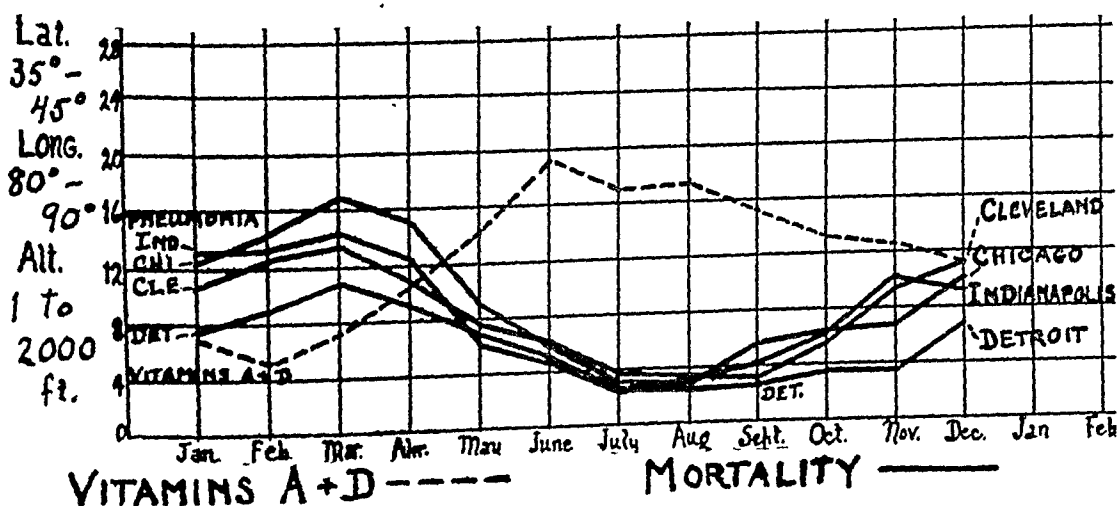
In Figure II will be seen graphs for the average level by months for both vitamins A and D for a 5-state area for 1928, 1929, and 9 months of 1930. The vitamin A level is shown by the broken line and is the average for all samples for this area, and vitamin D is shown by the solid line. The outstanding feature is the low level of available fat soluble vitamins in the dairy products from November to May in many districts in the northern latitudes where the spring or summer rise comes much later than in the less northerly latitudes. Note that the vitamin levels for 1929 are shown to be higher than 1928 and higher for 1930 than for 1929.

In Figure III we see the relation of deaths from pneumonia in 4 cities to the level of a factor obtained by adding the vitamin units A and D. The curve for deaths from pneumonia is shown by the solid line and the vitamin A plus D curve by the broken line. It will be seen that there is a remarkable similarity in the pneumonia curves for these various cities, all having their high point in the late winter and the low point in the late summer; also, that in general these factors are in opposite phase to the vitamin level as expressed in the butter fats obtained throughout the months for this area.

The finding of such a relationship for one district may be coincidence. It is important to apply the principle to many districts. This I have accomplished by dividing the United States and Canada into 16

FIGURE III—RELATION OF DEATHS FROM PNEUMONIA IN FOUR CITIES TO LEVEL OF VITAMINS A PLUS D BY MONTHS

OHIO, INDIANA, ILLINOIS, MICHIGAN, AND WISCONSIN



RELATION OF DEATHS FROM PNEUMONIA AND HEART DISEASE TO LEVEL OF VITAMINS A+D BY MONTHS, UNITED STATES OF AMERICA AND CANADA BY GEOGRAPHIC DISTRICTS.

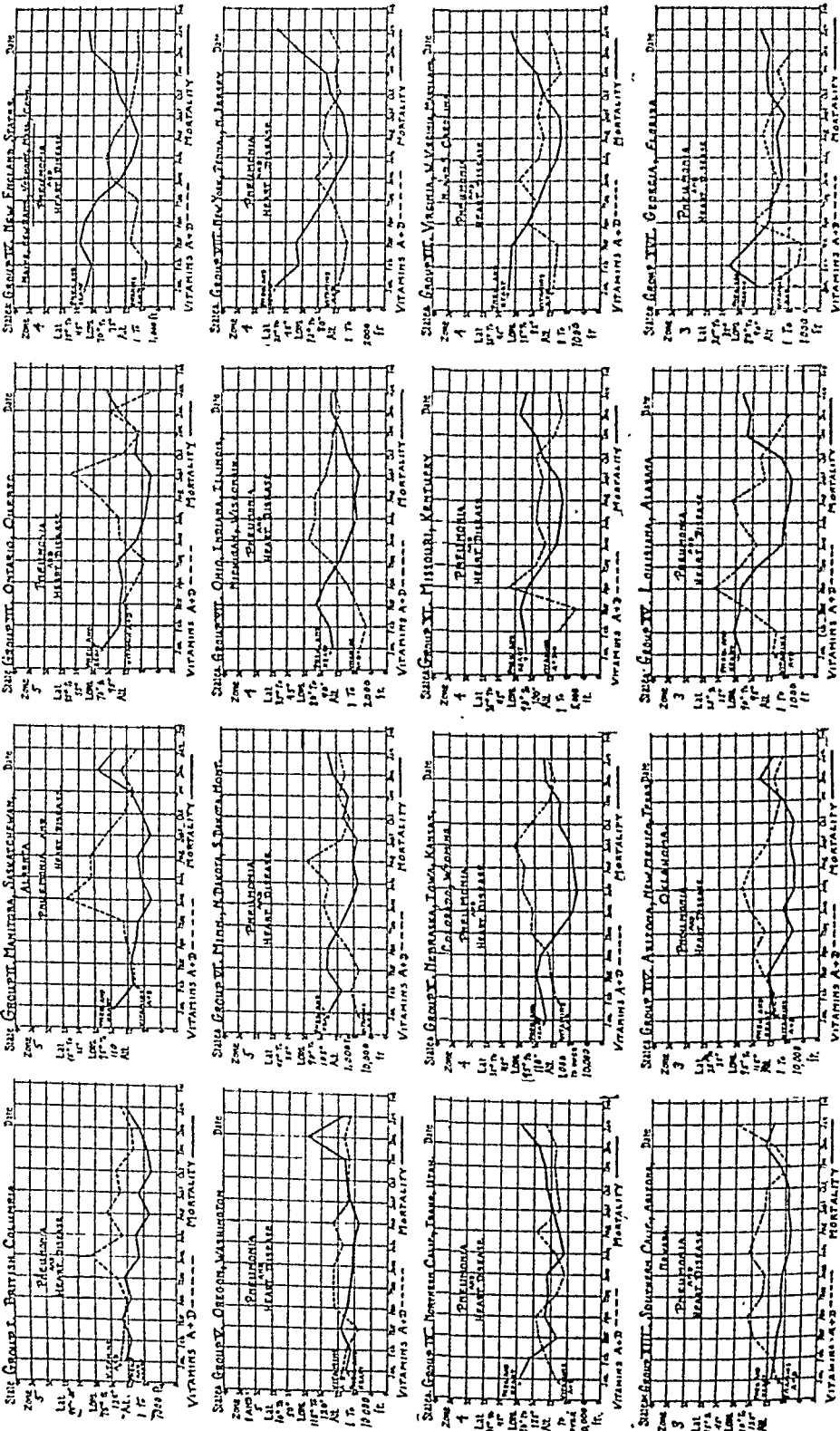


FIGURE IV

large geographic areas in the general order of their physical location as shown in Figure IV.

The solid line is a composite curve showing the deaths from pneumonia and heart disease and the broken line shows vitamin A plus D as expressed in the data obtained from the analyses of the butter and cream samples received month by month in 1929 from many places. In general when the vitamin curve is low the mortality curve is high.

There are two great sources of fat soluble food activators, namely the pastures of the sea and those of the land. Many people have the opinion that fish oil, particularly cod liver oil, would be a complete substitute for the fat soluble vitamins of land plant origin. In my clinical and technical investigations of the activators for inducing mineral metabolism, I have continually found evidence indicating that cod liver oil contains products that are very seriously toxic to humans and other land animals and can do much harm when given in large doses, even only as large as frequently advocated.

If it be true that we are dealing in these matters with factors that are related as cause and effect, it should be true also that data would readily be obtainable, throwing light on this whole problem by changing the incidence of morbidity and mortality as a result of administering or utilizing butter fat vitamins during periods of such low vitamin tides. Since dental caries is said to be the most universal disease in the world and is so important because of its significance as a nutritional disturbance, its prevention becomes one of the prime needs in any program for health betterment.

A study was made of 200 individuals during the fall, winter and spring of 1929-1930, on the basis of the development of dental caries (Figure V). Diagnosis included the use of X-rays at different periods and detailed instrumental examination. One group received no additional activators to those available in their regular dietary. Those in this group are shown for the different age periods by the dotted line; the solid line shows the number of cavities per individual in the various age groups for those receiving additional activators provided them each week in capsule form. It will be seen that there is a very marked difference in extent of dental caries of the two groups, amounting to tenfold as many cavities in those not receiving the additional activators as in those receiving them. In addition to the activators there was considerable counsel given regarding the selection of the dietary in general.

In 20 individuals between the ages of 10 and 20 not receiving additional activators, there was a total of 143 cavities when examined in the late spring and early summer of 1930, whereas in the group re-

EFFECT OF VITAMIN CAPSULES ON DENTAL CARIES BY 10 YEAR AGE GROUPS.

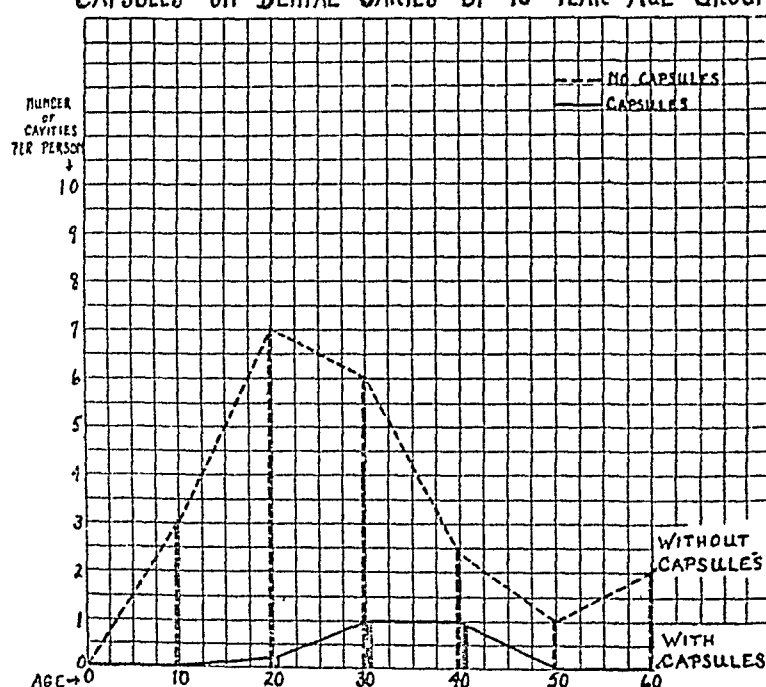


FIGURE V—Progress in control of dental caries, by difference in number of cavities developed per individual in group receiving special activators and those not receiving them.

ceiving additional vitamins there were only 3 cavities found in the 20 individuals. The additional activators were given in capsule form, each capsule containing 0.6 gm. Usually two capsules were taken with each meal. The capsules contained a mixture of the activators as concentrated from an exceptionally high vitamin butter, with about an equal quantity of an exceptionally high vitamin cod liver oil, both of which were selected by means of chemical tests. The improvement in general health, freedom from colds and capacity for work was very marked in all of these age groups receiving the capsules.

Since it is true that normal growth and maintenance of health are dependent upon the availability of the building blocks for growth, function and repair, it is not sufficient that we provide only the energy factors and the minerals, but also the activators with which these factors may be utilized. These apparently must come chiefly from plant sources. If the plant does not find in the soil the essential factors, chiefly mineral, and radiant energy out of which it can build its structures including its activators, it cannot provide for animal life those other building blocks without which animal tissues cannot be built or maintained.

When we study a map showing the locations where heart disease is most severe and on the increase, we find we are dealing in general with those areas that have been longest populated and the soil partly

depleted of such minerals as phosphorus, calcium, magnesium, potassium, etc. This newer view of disease, or the lack of growth and the maintenance of function, seems related primarily to the absence of this newer group of forces, the activators, and we see more clearly why we have the annual pilgrimages to the hospitals, and that many conditions we have thought of as diseases are really symptoms.

SUMMARY

Very little emphasis seems to have been placed upon or importance attached to the fact that annual tides have existed producing rhythmic rise and fall in the levels of vital phenomena. I have placed much emphasis upon the fact that the very existence of the tides as rise and fall in the levels of life is itself the indisputable evidence that the phenomena are related directly to factors which are variable from month to month in cycles.

Since the newer knowledge of the rôle of the activators, including vitamins, has shown them to be fundamental contributing and even controlling factors in growth and function; since all animal life is dependent upon plant life for its food supply; since the fat soluble activators are in general the most difficult to obtain; and since milk is the only single food that makes available all the various factors essential for life and growth; it has been used as the chief food product for these studies.

Intensive studies over a period of several years have revealed variations in the level of the fat soluble activators of milk which are traceable directly to the food of the animals providing the milk. The winter rise in morbidity and summer fall in the same seem to have some relation to the sun's position and to the growth of plants through the activity of the chlorophyll, which produces activating substances which are essential for animal life.

The extension of this study to dairy products obtained from many countries distributed throughout the world in both hemispheres demonstrates the presence of this relationship. The application of the principles involved by the administration of the fat soluble activating products that are obtainable from actively growing plant foods, particularly from milk fat produced from such foods, is found to be capable of effecting a very marked amelioration of the pathological phenomena associated with a reduction of infection through increased resistance as a defensive reaction, and in general is preventing the recurring cycle of morbidity in many individuals.

The accumulating evidence suggests the consideration of disease being, in many cases, more correctly speaking, a symptom and that

individuals often, instead of dying because they contract disease, primarily develop disease because they are dying. This interpretation provides an explanation for the increasing incidence of several diseases in particular localities, and seems to be associated with a depletion in the activating products of plant foods in these districts in part or chiefly the result of soil depletion of essential chemicals for efficient plant development, since these chemical elements are essential to the plant for creating these vitalizing activators which are essential for animal life.

To the extent to which these interpretations are correct, there is need for a change of emphasis in health programs from prophylaxis which has been found to be only partially effective, to an increase in the required activators partly by an improvement of soil conditions in order that plant life may be improved in quality, both for its use as food for humans and for the improvement of the nutrition of the foster mothers—the dairy animals—around which our civilizations have been built. This I interpret to be the means in the light of the best available knowledge for meeting the challenge of not only the Nordic races in the temperate zones, but for the betterment of human life wherever found; namely, to make available not only the mineral and other chemical elements needed for body building and repair, but also the vitalizing factors or activators, some of which are the known vitamins.

BIBLIOGRAPHY

1. Carr, F. H., and Price, E. A. *Biochem. J.*, 20: 497-501, 1926.
2. Yoder, L. *J. Biol. Chem.*, 70: 297 (Oct.), 1926.
3. Tid-dall, Frederick F., Brown, Alan, and Kelly, Arthur D. *Am. J. Dis. Child.*, Jan., 1930.
4. Poulsen, Edvard. The Quantitative Determination of Vitamin D, *Biochem. J.*, 20, 1, 1928.
5. McCollum, E. V., and Adams, G. *J. Biol. Chem.*, 78: 495 (July), 1928.
6. Price, Weston A. (102) Calcium and Phosphorus Utilization in Health and Disease; I, The Role of the Activators for Calcium and Phosphorus Metabolism; II, The Nature and Source of Calcium and Phosphorus Activators; III, Seasonal Variations in Butter-fat Vitamins and Their Relation to Seasonal Morbidity, *J. Certified Milk*, Oct., Nov., Dec., 1929; and *Dominion Dent. J.*, Oct., Nov., 1929.
7. Price, Weston A. (108) Vitamin Tides and Their Expression in Seasonal Disease, Including Dental Disturbances, *J. Am. Dent. Assn.*
8. Price, Weston A. (95) Calcium Metabolism Studies; A. The Raising of Serum Calcium by Tropical Applications of Raw and Activated Cod Liver Oil; B. Disturbances Associated with the Active Dental Caries of Childhood and Pregnancy, *J. Am. Dis. Child.*, 33: 78-95 (Jan.), 1927.
9. Price, Weston A. (97) Calcium, its Activation, Utilization and Metabolism, *J. Am. Dent. Assn.*, Apr., 1928.
10. Price, Weston A. (99) Some New Fundamentals for the Prevention of Dental Disease, with Special Consideration of Calcification and Decalcification Processes, *Dental Cosmos*, Feb., 1929.
11. Price, Weston A. (100) Calcium Metabolism Studies on the Nature and Role of the Activators: Researches on Fundamentals for the Prevention of Dental Disease, *J. Am. Dent. Assn.*, Feb., 1929.
12. Price, Weston A. (101) New Fundamentals for the Treatment and Prevention of Dental Disease Based on Calcium Utilization and Disturbance, with Special Consideration of Factors Determining When an Infected Tooth Becomes a Liability, *J. Am. Dent. Assn.*, Mar., 1929.
13. Price, Weston A. (103) Seasonal Variations in Butter-fat Vitamins and Their Relation to Seasonal Morbidity, Including Dental Caries and Disturbed Calcification, *J. Am. Dent. Assn.*, May, 1930.
14. Price, Weston A. (106) Why the Annual Pilgrimages to the Hospitals?, *Your Health*, Mar., 1930.
15. Price, Weston A. (107) Some Contributing Factors to the Degenerative Diseases, with Special Consideration of the Role of Dental Focal Infections and Seasonal Tides in Defensive Vitamins, *Dental Cosmos*, Oct., Nov., 1930.
16. Price, Weston A. (110) Some Means for Improving Human Life by Increasing the Vitamin Content of Milk and Its Products, *Assn. Bull.*, Internat. Assn. Milk Dealers, Jan. 29, 1931.

Physical Findings in New York City Continuation School Boys*

An Element in the Vital Statistics of Adolescents

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THIS is a preliminary and general medical and statistical study of material derived from personal examination of 2,691 working boys, 14 to 17 years of age, examined during 3 years—1926 to 1929—at the West Side Continuation School in the borough of Manhattan, and from selected items from examination of 4,661 boys in the Brooklyn Boys' Continuation School during the year 1929–1930 by the writer and three other physicians under his supervision.

The first group was part of the examinations of boys and girls done in a 3-year experiment in which three agencies coöperated: the New York City Department of Health through the Division of Industrial Hygiene, Dr. E. S. Morton, chief; the New York City Department of Education through the Director of Continuation Schools, Mr. Siegel, and Charles Degen who was in active educational charge; and the Public Educational Association through Mrs. Kinney, together with the Academy of Medicine through Dr. Corwin and with a number of advisory medical committees. The Brooklyn work is being done under the same agencies of the Health and Education Departments and the Kings County Medical Society, the participation of which medical organization is a novel and highly important excursion in public health work.

In this paper it is desired to give not only the results of the examination, but to discuss the possibilities of standards of history taking, of methods of physical examination, and of diagnosis; to point out the medical peculiarities of this group; and to add to our general knowledge of the diseases and vital statistics of these 14 to 17 year old boys as far as it has been possible to analyze and correlate the findings at present. No extensive or full data exist in medical books or literature on this group; as the work has progressed, more than one

* Read before the Vital Statistics Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

condition of interest has appeared and has led to the belief that a certain medical hiatus might begin to be filled. Infancy and childhood have been widely and exhaustively combed and studied, but the adolescent age of 14 to 17 is more or less of a medical *terra incognita*.

The boys were either workers or prospective workers. A thorough history taken by a nurse is followed by a thorough physical examination by the doctor. The history (Table I*) covers family, home conditions, recreations, habits, subjective symptoms, previous diseases, vaccination, industrial diseases, diphtheria immunization, accidents, and operations. The physical examination (Table II*) covers all the systems and special organs and aims to yield as careful and expert a search for physical defects as can be given in any private physician's office. It will be understood that X-ray and laboratory tests are not done but are recommended in every case where they are considered necessary for diagnosis or treatment.

The doctor lists the defects on the chart, also making a list for the pupil to take home for the parents or doctor and for the teacher's records. To the pupil is explained the results of his examination, the meaning of each defect for the present and its import for the future, and directions are given for remedying the same by simple hygienic measures, by reference to his private physician or, if a physician cannot be paid, to a clinic. This medical advice is supplemented by classroom instruction in a series of lessons developed by Mr. Degen on personal and applied hygiene based on the defects revealed by medical findings. All efforts are made to obtain the written opinion of the private physician and to record all reports from clinics.

The boy is called the following week when he is again examined and questioned as to what he has done, and is called weekly until normal. Records of these follow-ups are placed on the chart in code showing weight, improvement, cure, etc., and full notes are kept as to visits to physicians or clinic. If no coöperation is attained in the serious cases, a home visit is made either by the teacher or social worker. At the end of 6 months a reëxamination entailing another complete history and physical examination is made for each boy whether originally normal or not.

In addition to the above method used in Manhattan, very important pioneer aid has been rendered in Brooklyn by the Kings County Medical Society through its secretary, Dr. Alec Thomson. To this organization is sent by the examining doctor the name and address of the boy, also of his private physician together with a list of defects found in any case that is considered serious. The medical society then com-

* Available upon request to Dr. Meyers.

municates such information in writing to the physician, asking him to communicate with the boy and arrange for medical supervision of the case. I believe the many sincere responses received from private physicians have demonstrated the great benefits to the boys and the helpful and hopeful basis for coöperation between private and public medicine.

A tabulation of the physical defects found in the original examinations of 2,691 boys (Table III*) was compiled by the statistical department of the Metropolitan Life Insurance Co.† There were 6,522 defects or 2.4 per boy compared with 1,423 in 728 boys examined by me in Brooklyn, or 2 per boy. Twenty-three hundred and thirty-six, or 86.5 per cent, showed one or more defects. There were 13.2 per cent normal, compared with 12.8 per cent in 728 and 10.5 per cent in 2,940 examined by four physicians in Brooklyn.

The most common defects in order of frequency were:

Unclean teeth	Flat-feet	Round shoulders
Underweight	Delayed adolescence	Habitus asthenicus
Dental caries	Palpable tonsillar glands without tonsillectomy	Adenoids
Cervical adenitis	Chronic pharyngitis	Chronic otitis media
Uncorrected visual defects	Suspected old tuberculosis	Defective hearing
Pyorrhea	Acne	Rickets
Excessive cigarettes	Impacted wax	Chronic heart disease
Flat chest	Coated tongue	Constipation
Visual defects corrected but glasses not worn	Anemia	Scoliosis
Poor muscular development	Lack of bathing	Diseased tonsils
Nasal obstruction	Bad breath	Enlarged liver

Considering unclean teeth a defect, they showed the largest number, 1,593 or in 59.2 per cent of the boys. Normal except for unclean teeth were 332, or 12.8 per cent in 728, and 10.8 per cent in 2,940 boys examined by four physicians. If we do not consider unclean teeth a bar to a normal physical condition, we can list 25.5 per cent normal in Manhattan against 25.6 per cent in 728 boys, and 21.4 per cent of 2,940 reported by four physicians in Brooklyn.

Underweight, based on more than 10 per cent under the averages of the Baldwin-Wood Scale, gave 527 or 19.6 per cent, compared with 8.4 per cent in 728 boys, and 8.2 per cent in 2,063, by two doctors in Brooklyn. Overweight, based on more than 10 per cent above averages, showed 48 or 1.8 per cent, compared with 9.5 per cent in 728; 14 other cases or 0.5 per cent were listed as obesity compared with 15 or 2 per cent in 728. Malnutrition gave 85 or 3.2 per cent compared with 1 or 0.1 per cent in 728.

Organic heart disease listed 31 or 1.2 per cent, against 3.3 per cent

* Available upon request to Dr. Meyers.

† Thanks are hereby expressed to Dr. Dublin, Statistician of the company, in giving the facilities of his department for the tabulation and to Edwin W. Kopf, Assistant Statistician in active charge, for his constant friendly encouragement and valuable suggestions.

in 728, 1.5 per cent in 1,335, 2.7 per cent in 440, and 3.2 per cent in 437, or 2.5 per cent in 2,940 in Brooklyn. Cardiac anomalies (various murmurs in conditions not regarded as indicative of organic heart disease), 11 or 0.4 per cent, against 2.2 per cent of four physicians.

In 89 or 3.3 per cent, there was cause for suspicion of old healed tuberculosis of the lungs, while in 728 cases 9 or 1.1 per cent were found. *Habitus asthenicus* was present in 38 or 1.5 per cent against 0.7 per cent in 728. Two cases of active tuberculosis were listed against none in 3,410 boys among three doctors in Brooklyn. In 19 or 0.7 per cent, a family history of tuberculosis was elicited. In three cases a cervical adenitis was considered tuberculous in origin. In 14 or 0.5 per cent old plastic pleurisy existed; in 7 cases chronic bronchitis, and in 2 asthma. *Pyorrhea* gave 171 or 6.4 per cent against 3.5 per cent in 728. Enlarged tonsils were 121 or 4.5 per cent, compared with 1.8 per cent in 728 and 4.8 per cent in 4,661 by four doctors; diseased tonsils 23 or 0.9 per cent against 2.1 per cent of 728 and 2.6 per cent of 4,661 boys by four doctors.

There were 259 or 9.2 per cent with distinctly palpable, large cervical glands against 3.6 per cent in 728, and 100 or 3.7 per cent of hard or enlarged tonsillar glands or nodes without tonsillectomy, against 4.5 per cent in 728. Only two such cases were found after tonsillectomy against 4 in 728.

Anemia gave 61 or 2.3 per cent compared with 17 or 2.5 per cent in 728. Constipation showed 26 or 0.9 per cent against 21 or 2.9 per cent in 728 and 68 or 2.4 per cent of 2,940 boys among four physicians.

There were 23 or 0.9 per cent of enlarged liver, of which 3 were associated with catarrhal jaundice, 6 with coated tongue, and 14 with constipation. This compares with 20 or 2.7 per cent in 728 cases, of which 11 were associated with constipation, 8 with coated tongue and 1 primary. There were 90 boys or 3.4 per cent with coated tongues, of which 6 showed enlarged liver, only 1 constipation, 1 chronic gastritis, and 3 bad breath.

There were 75 cases of acne or 2.8 per cent, 3 of psoriasis, 13, scabies; 21, warts; 29, chronic eczema; 3, *tinea versicolor*; 9, herpes; 1, *pityriasis rosea*; 6, *trichophytosis*; and 3, *ichthyosis*. There were 41 or 1.5 per cent of round shoulders, 12 or 0.4 per cent of moderate kyphosis, none of which was apparently of tuberculous origin, 27 or 1 per cent of scoliosis, 145 or 5.4 per cent of poorly developed musculature, and 158 or 5.9 per cent of flat or undeveloped chest. Poor musculature and flat chest might exist in the same boy as many exhibited 2, 3, 4, and even 7, 8 or more defects. Flat feet showed in 106 or 3.9 per cent.

Excessive cigarette smoking was found in 165 or 6.1 per cent, and in Brooklyn in 3,410 boys by three doctors in 9.7 per cent. The total number of smokers among the 3,410 boys was 1,049 or 30.9 per cent, and of these 32 per cent or nearly one-third were considered excessive users. As to eyes, 196 or 7.3 per cent had uncorrected defective vision, 130 or 5 per cent corrected vision, 146 or 5.4 per cent had obtained glasses but were not using them. As to ears, there were 7 cases of acute otitis media, 35 or 1.2 per cent of the chronic form, 3 of acute mastoiditis, 78 or 29 per cent of impacted wax, and 34 or 1.2 per cent of defective hearing. There were 39 or 1.3 per cent of probable adenoids.

Listed are 13 or 0.5 per cent of inguinal hernia, 11 of undescended testicles, 7 of varicocele, 5 of hydrocele of the cord, 2 of acute gonorrhea, 2 of hermaphroditism. In the nervous and endocrine systems, 11 cases of very "nervous" or neurasthenic type, 21 with residual evidence of old paralysis due to poliomyelitis, birth-palsies, or encephalitis lethargica, 4 of hyperthyroidism, 9 of gonadal dysfunction, 5 of pituitary, 103 or 3.8 per cent with delayed adolescence (small genitalia, little or no pubic hair), against 1.1 per cent in 728 in Brooklyn, 5 of simple goiter, and 13 of feminism.

The following items are of interest:

Canities	4	Epilepsy	2
Exophthalmos	1	Chorea	2
Blindness in 1 eye	5	Hydrocephalus	1
Cauliflower ear	1	Microcephalus	1
Frontal sinusitis	1	Excessive exercise	2
Maxillary sinusitis	1	Lack of exercise	16 (0.6%)
Hutchinson's teeth	8 (0.3%)	Fatigue	1
Rickets	31 (1.2%)	Bad breath	48 (1.8%)
Lobar pneumonia	1	Insufficient sleep	5
Unresolved pneumonia	1	Hereditary lues	4
Emphysema	1	Wassermann test advised	25 (1%)
Congelation, dry-ice	1	Urinalysis advised	24 (1%)
Enteroptosis	5	Diabetes mellitus	1
Gastroptosis	2	Excessive tea or coffee	9 (0.3%)
Chronic appendicitis	3	Stuttering or stammering	23 (0.9%)
Acute appendicitis	1	Possible benzol poisoning	2
Rectal abscess	1	Lack of animal protein in diet	3
Pyloric obstruction	1	Lack of vegetables	1
Traumatic cholecystitis	1	Hemophilia	1
Basal metabolism test advised	3	Dirt-eater	1

As stated, each boy underwent a second complete examination at the end of 6 months. Table IV,* prepared by the statistical department of the Metropolitan Life Insurance Company, shows the results in 485 of 2,691 boys so examined as to total and individual defects remedied or improved. Of 1,223 defects found at first, 583 or 47.7

* Available upon request to Dr. Meyers.

per cent were cured, or bettered. On first examination there were 2.5 defects per boy; on the second 1.2. It will be understood that in the interval the boys were seen weekly many times for follow-up examinations and medical advice and that many had been to physicians or clinics or followed hygienic advice.

For underweight, 35 or 31.5 per cent of the original 111 became normal; these had been advised as to diet and exercise or had consulted physicians for tonics, but it must be remembered that some of these boys may in the natural course of development gain requisite weight. In malnutrition, 8 or 32 per cent of 25 became normal; defective vision, 19 or 52.8 per cent of 36; defective tonsils, 16 or 57.1 per cent of 28; carious teeth, 27 or 61.4 per cent of 44; unclean teeth, 104 or 35.1 per cent of 296; pyorrhea, 20 or 58.8 per cent of 34; organic heart disease, 2 or 22.2 per cent of 9; acne, 7 or 58.3 per cent of 12; cervical adenitis, 19 or 48.7 per cent of 39; anemia, 8 or 47.1 per cent of 17; poor personal hygiene, 7 or 77.8 per cent of 9; excessive cigarettes, 8 or 44.4 per cent of 18; and 236 or 61.9 per cent of 381 other miscellaneous defects. These are excellent results and corroborate the impression of real interest in most of the boys in their condition, their coöperation with the examining doctor, the aid of the private physician, the sincere effort of the examining physicians, and the general excellence of the interrelated activities of the educational, social and medical agencies in the experiment.

In the original 2,691 examinations there were found 6,522 defects divided into 234 separate medical or surgical conditions. From the clinical aspects all these findings are of importance for present health and prevention of future diseases; but the group does not evidence many acute threatening conditions. This adolescent group, just as it shows a marked tendency to growth, displays a distinct resistance to disease. Analysis of the findings in this light and a consideration of other and comparative statistics will be of interest.

For 1919-1920 the death-rates¹ per 1,000 white males living at ages considered, U. S. Registration Area, were: under 1 year, 84.33; at 1, 17.59; at 2, 8.45; at 7, 3.01; at 12, 2.20; at 17, 3.93; at 22, 4.94; at 27, 5.97; at 32, 6.89. For New York City as a whole they were: under 1 year, 89.45; at 1, 23.07; at 2, 9.46; at 7, 3.65; at 12, 2.24; at 17, 3.83; at 22, 5.49; at 27, 6.21; at 32, 7.41. From under 1 year then there is a fall to 12; at 17 the rate has begun to rise and continues to rise until at 77 years with 111.20 per 1,000 it is far above infancy rates. In 1920, 8.6 per cent of the total male population of the United States was in the group 15-19. For the intercensal periods from 1880 to 1920 this group has increased 31.2, 15.4, 20.7, and 3.2 per cent.

Table V* prepared for me by the Bureau of Records of the Health Department, shows the causes of death in the Borough of Manhattan for 1929, ages 14, 15, 16 inclusive for males and females. Deaths numbered 62 at 14 years, 67 at 15, and 81 at 16. Among the causes were typhoid, 1; scarlet fever, 1; diphtheria, 2; influenza, 4; epidemic cerebrospinal meningitis, 10; tuberculosis, 45, of which 35 were of the respiratory system; cancer, 5, of which the stomach, lung and pancreas were each 1 and the bones 2; benign tumors, 6; acute and chronic articular rheumatism, 10; anemia, 1; leukemia, 1; ear and mastoid, 9; heart disease, 19, of which 16 were of chronic endocarditis; appendicitis, 6; hereditary syphilis, 1; chronic nephritis, 4; bronchopneumonia, 3; lobar pneumonia, 12; suicide, 1; homicide, 6; accidents, 32. In the 4 cases of influenza, 3 gave pneumonia and 1 heart disease as contributory to death.

The principal causes of death are then tuberculosis, accidents and heart disease with lobar pneumonia, rheumatism, epidemic cerebrospinal meningitis, mastoiditis and appendicitis following. For the boys, accidents head the list with 23, then tuberculosis, 18; lobar pneumonia, 8; heart disease, 6; epidemic cerebrospinal meningitis, 6; cancer, 5. The male and female population at these ages for 1920 in Manhattan are about equal. The deaths show for respiratory tuberculosis, 23 females to 12 males; chronic endocarditis, 10 females to 6 males; lobar pneumonia, 8 males to 4 females; accidents, 23 males to 9 females; cancer, 5 males to no females. The mortality rate in our age group is then low, and the morbidity causes outside of tuberculosis and heart disease, which are known to be low, not alarming.

GROWTH AND DISEASES IN AGE GROUPS

Minot,² in his classical work on age, growth and death, gives the yearly percentage increments in weights for boys from the end of 9 to the end of 10 as 11.6 per cent; 10-11, 6.5 per cent; 11-12, 7.1 per cent; 12-13, 7.9 per cent; 13-14, 11 per cent; 14-15, 11.7 per cent; 15-16, 15.7 per cent; 16-17, 10 per cent; 17-18, 4.9 per cent; 18-19, 1.9 per cent. Just in our age group the body has a recrudescence of growth. In girls this development occurs 2 years earlier. Sydenstricker,³ in his Hagerstown morbidity studies, notes that each period of life is characterized by its own distribution of illnesses, that in childhood respiratory, communicable, skin, ear, eye, tooth, nervous and digestive conditions and diseases cause most illnesses; that in old age heart, kidney and nervous conditions cause most illnesses; but in adolescence and

* Available upon request to Dr. Meyers.

young adult ages illnesses from all these causes are at their lowest levels. As the work on our age group of boys has progressed, impressions as to incidence of disease in general and the occurrence or lack of occurrence of certain conditions have become stronger. It will be interesting to analyze our findings and to compare them with existing statistics.

Gonorrhea—In the Manhattan study of 2,691 boys only 2 cases, or 0.3 per cent, of gonorrhea were found, both acute. In the Brooklyn group, among 728, no cases, and in 4,661 of four physicians, 5 cases or 0.1 per cent. It is possible that some chronic cases escaped detection, but as the boys were stripped for this examination, it is unlikely that many acute cases were missed. This lack of gonorrhea is rather striking. Brunet and Edwards,⁴ in a survey of Detroit physicians, hospitals, and clinics, for May 15, 1926, report 8,070 cases of gonorrhea under observation. Of these, boys under 16 showed 1.1 per cent for acute cases and 0.9 per cent for chronic. Females under 16 showed much greater numbers. Deacon,⁵ in his Michigan study of 29,741 cases of gonorrhea, reports a low incidence to about 15 when a rapid rise to a top in the group 20–24 occurs. This holds also for gonorrhea and syphilis combined. Among girls, the rates are continuously higher until 22. Out of 21,677 gonorrheas in white males, 49 were 10–14, 2,264, 15–19, and 8,190, 20–24. Somewhere between 10–14 and 15–19 there is a marked increase from 0.2 per cent to 10 per cent, but we found no such high incidence in our 14–17 groups, but figures comparable to Deacon's 10–14 group.

Syphilis—No case of the acquired form was found in Manhattan. In Brooklyn, 2 cases were so diagnosed in 4,661 by four doctors; the 2 by one doctor in 1,347 boys. In Manhattan 8 cases of Hutchinson's teeth occurred and in 25, or 1 per cent, a Wassermann was advised on suspicion of hereditary lues. In 728 boys in Brooklyn, 3 were listed as hereditary lues and 6 or 0.9 per cent were advised to have a Wassermann. In the Deacon⁵ study of 15,486 male syphilitics, 117 were 10–14; 496, 15–19; 2,548, 20–24. How many in the earlier ages are hereditary is not stated. Brunet and Edwards⁴ in the Detroit study for the male acute syphilis cases (infection 1 year or less) report 6.2 per cent occurring under 16 years. We may have failed to discover all cases, but out of 7,352 boys in the 2 schools there were found only 7 cases or 0.09 per cent of gonorrhea and 2 or 0.03 per cent of acquired syphilis. We are then dealing with a group showing little venereal infection, a finding of importance in statistical and diagnostic knowledge for the examiner and of possible preventive and social value to the boy.

Abdominal Conditions—Only 26 or 0.9 per cent of constipation were found. As in early infancy and childhood and in adult life constipation is regarded by physicians and laity as quite common, this adolescent group would seem quite free. In Brooklyn, 21 or 2.9 per cent of 728 and 68 or 2.4 per cent of 2,940 among four doctors were found. Most of the cases were not severe or persistent; an occasional constipation for 2 or 3 days. In Brooklyn, special attention was directed to the number of daily bowel movements; most reported 1, or 1 and 2, and many, 1, 2 and 3 daily. Sydenstricker^a found no cases of constipation in his 5-9, 10-14, 15-24 age groups, and gives annual rates per 1,000 for all ages of 8.5 per cent, for ages 0-4, 11.3 per cent; 25-44, 12.9 per cent; 45-64, 11.6 per cent; 65 and over, 37 per cent. These findings as with his others are not strictly comparable to those findings of our group as he would find such conditions only when reported as a major cause of illness, as he says, while our survey is based on intensive general history taking and examination. Our adolescent group shows a healthy and active intestinal system and should offer a field for dietary and physical instruction in the avoidance of future constipation. In 14 of the 26 cases an enlarged liver was found; possibly these 14 represent the more persistent and severe cases.

In Brooklyn, 11 of 21 gave enlarged liver. Of 90 boys or 3.3 per cent with distinctly coated tongues, only 1 was associated with constipation, 6 with enlarged livers, 3 with bad breath and 1 with gastritis. In Brooklyn, 31 or 4.3 per cent of 728 showed coated tongues; of these 11 or 35.5 per cent were associated with enlarged liver, 1 with gastritis and none with constipation. It would seem in this group that coated tongues are not particularly associated with constipation, bad breath or gastritis, but more with enlarged liver. Bad or unpleasant breath in 48, or 1.8 per cent, was also not frequent in constipation. Negro boys often showed a markedly furred tongue for no apparent reason and Italians frequently had bad breath, due possibly to peculiarities in diet.

Attention is called to the infrequency of acute appendicitis, 1 case, and of chronic appendicitis, 3 cases. There may be a causal or pendant relation of appendicitis to the infrequency of constipation. Very recently the Metropolitan Life Insurance Company⁷ has reported its industrial insurance experience for deaths from appendicitis since 1911. For white males all age groups have shown a distinct increase except 10-14 with a decrease of 2.6 per cent, and 15-19 with a decrease of 2.8 per cent, against an increase of 20 per cent for all ages. For white females, only the 10-14, 15-19 and 20-24 groups show decreases. We again note distinct peculiarities in our adolescent group.

We note also that the group shows little or no diarrheal or irritative gastric or intestinal conditions. There seemed in the 2,691 boys and in the 728 in Brooklyn a very general knowledge and practice of a mixed balanced diet. Only 1 boy in Manhattan reported that he ate no vegetables; 3 reported abstinence from animal protein; only 1 was a faddist on raw vegetables. To what extent diet may be related in our group to the low incidence of constipation, appendicitis and other intestinal and gastric conditions or the active working life and the general vitality and resistance of these years is an interesting question.

Tuberculosis—Only 2 active cases were found and none in 2,490 among three doctors in Brooklyn. In Manhattan 89 or 3.3 per cent were listed as possible old healed pulmonary cases. The finding was based on dullness over one or both apices or other areas, abnormal breathing, limited apical projection fields or difference in width of the apices, or lack of expansion of the inferior limits associated with dull or limited apex. No attempt was made to differentiate between childhood and adult types of infection. Findings of 38 or 1.5 per cent of habitus asthenicus or phthisicus were listed, 19 or 0.7 per cent with ascertainable family history, 3 with a cervical adenitis with a childhood history of neck gland operation, 14 or 0.5 per cent of chronic plastic pleurisy, 7 or 0.3 per cent of chronic bronchitis, 2 of asthma, 1 of rectal abscess and 1 of tuberculosis of the eye. In this category our group is again comparatively free. Drolet⁶ gives the general tuberculosis rate per 100,000 for New York City for males living in each age group for 1928 as: 0-4 years, 53; 5-9, 12; 10-14, 13; 15-19, 66; 20-24, 110; 25-29, 114; 40-44, 180; and 60-64, 256. Chadwick⁷ in Massachusetts in the last two years found among 51,000 school children below high school age that 1.5 per cent showed the childhood type and 3.4 per cent were suspicious. Only 1 in 3,200 examined was of adult type. Based on Chadwick's findings, Bolduan⁸ estimates for New York City that nearly 20,000 school children should show the childhood type. In females, Drolet gives the peak for 1928 in the group 20-25 instead of being as formerly in 30-35 and concludes:

In a given 1,000 tuberculous deaths in New York City at the present time the age concentration among females is at 20-25 years; among males, 40-45; among negro males at 25-30, and white males 40-45; among both negro and white females at 20-25; among Jewish males, after 45.

Heart—Twenty-nine or 1.1 per cent were listed as organic heart disease. In addition, there were 2 diagnosed as athletic heart; they showed cardiac enlargement with a systolic apical murmur and a his-

tory of strenuous athletics. In 3 others, simple cardiac enlargement was noted; urinalysis was advised. In 13 or 0.5 per cent there was circulatory asthenia, in 24 or 0.9 per cent functional arrhythmia associated in 1 case with organic heart disease; in 46 or 1.7 per cent a tachycardia with pulse of 96 or more, most of which cases gave the impression of excitement due to the examination; in 2 a marked bradycardia of 42 and 48. A pulse of 60 in the boys was not infrequent. In 11 or 0.4 per cent there were murmurs, apical, basal aortic or pulmonic or combinations, with no enlargement, that were classed as cardiac anomalies, including open ductus arteriosus, patent foramen ovale, ill-defined pulmonic valve or artery conditions, but not respiratory murmurs. It was felt that such a grouping should be made as in these cases they should be told the murmur does not mean organic heart disease as might be erroneously diagnosed with a resultant impairment of his physical and industrial activity, and his peace of mind.

In the group of organic disease, many knew of no cardiac condition, none was seriously incapacitated, a few had moderate dyspnea on exertion, but all would be placed in Class I of the American Heart Association classification.

In Brooklyn of 728 boys I found 3.3 per cent of organic heart disease, one physician 1.5 per cent in 1,335; one, 2 per cent in 440; and one, 3.2 per cent in 437—an average of 2.5 per cent in 2,940. There were frequent consultations between the two morning and the two afternoon doctors in any questionable case. Of cardiac anomalies I found 2.7 per cent; the other three physicians, 1.5 per cent; two, 3.2 per cent or 2.2 per cent for 2,940 boys. In all, 136 boys were found with murmurs, but of these 64 or 45 per cent were not regarded as of chronic valvular disease. Of the 728, a history of previous treatment for heart disease was given in 2, but examination showed nothing. In 2 cases diagnosed organic disease, on weekly follow-ups, the murmurs disappeared. Whether this is a return to normal or the hearts might again give murmurs is interesting. One case of dextrocardia was discovered in 2,940. Further analysis of this group in relation to etiology, smoking and exertion should be valuable.

Each organic case was told of his present condition and careful instructions given against cardiac strain. How important this may be for his future can be seen in the great rise in cardiac deaths at 35-44 and later. In economic groups similar to ours the Metropolitan Life Insurance Company" reports death rates, per 100,000 white males, from heart disease (pericarditis, acute endocarditis and myocarditis, angina pectoris, other diseases of the heart) in its industrial department for 1929, 1 year and over, 155.8; 1-4, 7.8; 10-14, 17.6; 15-19,

26.9; 20-24, 31.7; 25-34, 46.8; 35-44, 134.4. Cahan" in a recent Philadelphia study of 1,821 high school boys up to 17 years reports 1 per cent of organic heart disease. Among school children" in different cities in this country the incidence of organic disease reported has varied from 0.63 per cent to 1.7 per cent. In elementary school children in England and Wales 0.7 per cent was found. In the Hagerstown survey Sydenstricker" gives the illness rate for diseases of the circulatory system as 9.6 per 1,000 for age 0-4; 7.6, 5-9; 15.8, 10-14; 8.3, 15-24; 12.9, 25-44; 31, 45-64.

It should be noted that, unless the chest is bared in all examined in standing, recumbent and left lateral positions or after exercise, all conditions of the heart will not be discovered or properly diagnosed. For this reason, statistics as to the prevalence of organic heart disease among students will vary. All our boys were examined with all clothing removed from chest and with facilities for recumbency. The heart disease death rate" per 100,000 population, male and female, for 1924 for age groups 10-14 was 20.5; 15-19, 26.7; 20-24, 26.6. Compared with rates of 1914, the 10-14 shows a reduction of 18 per cent, the 15-19 a rise of 8.5 per cent and the 20-24 a rise of 2.3 per cent. Figures given by the Medical Society of the State of New York" from studies by Davenport and Love on heart defects in drafted men show that of each 1,000, 45.07 showed some form of organic heart disease probably due wholly to damage of rheumatic infection, and 30.09 per 1,000 showed valvular defects. It seems apparent that just at the age of our continuation school boys much cardiac diagnostic and prophylactic investigation and advice are in order.

SPECIAL INTERESTING DEFECTS

Among other defects of special interest were flat-foot in 106 or 3.9 per cent, of which 3 cases had had arches made. None complained of any pain or disability. It would seem that in this age and group flat-foot is not a particularly disturbing condition. One hundred and ninety-six or 7.3 per cent had defective vision uncorrected by glasses, another 146 or 5.4 per cent had at some time procured glasses, but were not wearing them through negligence or fear of ridicule, another 130 or 5 per cent were corrected by glasses before our examination; in all, 17.7 per cent needed visual correction. Seven cases of acute otitis media were diagnosed and 3 of subacute and 35 of chronic found. Enlarged tonsils existed in 121 or 4.5 per cent but a diagnosis of diseased tonsils was made in only 23 or 0.9 per cent. Among 728 in Brooklyn, 4.8 per cent gave enlarged tonsils and 2.6 per cent diseased. In 100 or 3.7 per cent there were hard and mostly enlarged tonsillar glands or

nodes on one or both sides without tonsillectomy, and only 2 cases with a history of the operation.

In Brooklyn, in 728, 33 or 4.5 per cent were found with the condition without tonsillectomy and 4 cases after it. Chronic cervical adenitis was found in 259 or 9.2 per cent; in 3 cases persistence of an old tuberculous adenitis diagnosed. In Brooklyn, in 728, 3.6 per cent were found; this difference apparently coinciding with their better general nutritional condition. Of the 11 cases of undescended testicles, 7 of varicocele and 5 of hydrocele of the cord, none complained. Of the 80 cases of posture defect none was sufficiently serious to cause subjective complaint or interfere with any activity. The same applies to the endocrine disturbances and to the anemias. In 16 no exercise was taken, either because the boys' occupation was strenuous or through lack of social sense. In 2 there was over-exercise and in others there arose the question of training and reducing weight for boxing. It is a question if boys at this age and stage of development should over prolonged periods retard gain in weight. Two possible cases of benzol poisoning were followed by blood counts and inspection of work premises, but no basis for poisoning by fumes found.

Of the 1,049 smokers among 3,387 boys in Brooklyn with very few exceptions cigarettes were used, most of them inhaled, a few had smoked since the age of 6 or 7. A few were smoking 30, 40 or 50 cigarettes daily; but most of those classed as excessive smokers used 15 to 20. It should be understood that in cases of underweight, malnutrition, heart disease, poor muscular and chest development, habitus asthenicus, suspicious lung findings or anemia, any use of cigarettes at all was viewed as excessive, while in the robust even 10 or 15 cigarettes were not regarded as excessive. I found only 1 boy who was apparently lying about using cigarettes. The same applies in general to hygiene of the teeth. Some boys had apparently never cleaned their teeth all their lives; 2 boys with the dirtiest teeth worked for dental laboratories. The boy of the most untidy and unclean appearance was employed by a dyer and cleaner. Only 1 case of diabetes mellitus was found.

STANDARDIZATION OF HISTORY TAKING, PHYSICAL EXAMINATION, AND DIAGNOSIS

In such group examinations as these, the questions of standardization of methods of history-taking, of physical examination, of diagnosis and of the reliability of the diagnostic results of the different physicians are very important and most closely related. The nurse must be capable and on the alert to obtain all possible leads on subjective

complaints, previous illnesses, and operations to relieve the doctor of the need of re-questioning the boy if an important defect is found. She should know and realize the implications of deficiencies in diet, duration and amount of smoking, inhaling, number of bowel movements and its possible relation to constipation, possible heart and lung complaints, and should have ready the temperature, pulse and respiration in any suspicious case.

As soon as a number of physicians is involved, individual differences in examination and diagnosis tend to complicate results. In the Brooklyn study which I supervised with a force of three other doctors who had had no previous experience except 1 month's instruction in this work, there were such variations. Giving my findings first, the percentages of normal were 12.8, 9.5, 12.5, 8.0; of normal except unclean teeth, 12.8, 8.7, 12.0, 13.0; organic heart disease, 3.3, 1.5, 2.7, 3.2; heart anomalies; 2.7, 1.5, 2.0, 3.2; possible old pulmonary tuberculosis, 1.1, 0.38, 0, 2.0; habitus asthenicus, 0.7, 3.0, 0.8, 0.6; constipation, 2.9, 1.9, 0.7, 2.0; enlarged tonsils, 2.5, 5.9, 5.0, 5.0; diseased tonsils, 2.1, 3.9, 1.3, 3.0. It is evident that there are some distinct variations here, but it must be remembered that the type of boy varied within the school itself, and for each doctor to get an average sample there should be an equalized distribution from commercial and academic classes. But with training of the physicians in the special problems of this work and in the recognition of the usual findings in such a group reliable data are possible. Such a basis is given in the diagnosis sheets given each doctor. These sheets, covering all the systems shown in Table II,* are based on the West Side study of 2,691 boys with their 234 different diagnoses (Table III*). They do not commit the individual doctor to limit himself in his diagnostic judgment as he may add any diagnosis to the list.

At the end of each week each doctor checks on his diagnosis sheets the number of defects found. Thus the supervising physician can meet his doctors in conference at any interval he desires, and review and discuss their problems and compare the percentages of each. Certain diagnostic errors or weaknesses can be thus corrected, and such conferences have been found most valuable for the general improvement of the medical work and the ability of the individual physician. Also the habit of consultation between the doctors in any questionable case minimizes mistakes. The doctors need high diagnostic training and ability to recognize important defects and to disregard minor findings. A single pimple does not make an acne to be counted a defect.

* Available upon request to Dr. Meyers.

During this summer special work has been done by the doctors in nose, throat and cardiac clinics.

But not only is diagnostic skill needed, but a certain standardization of examination is necessary that findings may be statistically comparable and of any value. Careful note was made of appearance as it has been found that an impression of health might not be corroborated after removal of clothing or *vice versa*. Not infrequently, postural defects or underweight or other defects were found in boys of healthy aspect. Weight and height were taken with the boy stripped to waist and shoes removed. Until the genitalia were examined the boy remained thus, when the rest of the clothing was lowered. For the ears and nose, electric specula were used. The throat was thoroughly explored for enlarged, cryptic, buried or pus tonsils, but no diagnosis of diseased tonsils was made unless chronicity was established or in doubtful cases, unless a history of a related infection or repeated tonsillitis existed, or hard, enlarged tonsillar glands or nodes palpable. The glands of the neck were palpated and a general division of chronic adenitis or hard tonsillar glands made.

Teeth were examined only visually. It is certain that a dentist would have discovered many more dental conditions.

The lungs were thoroughly examined, the apices percussed, their borders outlined and compared, as also the lower posterior borders and their expansion limits related to any apical disturbance. Auscultation was particularly directed to the apices, and the infra-scapular and basal areas. In any case of finding or suspicion, temperature, pulse and respiration were noted, and further X-ray examination by the private physician or clinic instituted.

The heart was examined with the chest bared, and in erect, recumbent, lateral positions or after exercise, as necessary. Each cardiac survey was not considered complete unless it contained statements as to cardiac enlargement, murmurs, their location, character and variability, possible etiological factor, knowledge of cardiac condition, and subjective symptoms. All necessary cases were referred to the private physician or clinic for corroborative or supplementary aid in diagnosis.

The abdomen was examined in any case of constipation, of coated tongue, bad breath, and any infra-diaphragmatic pain. The liver was investigated in constipation, in heart disease, in digestive complaints, coated tongue, and bad breath. Kidneys were palpated in suspicious complaints. The genitalia were routinely examined, hernias, groin and axilla considered.

Every system shown in Table II was examined and the results defi-

nitely noted in code as normal or showing specific findings. Every effort was made to eliminate any tendency to give symptomatic diagnoses. In doubtful cases, a question mark was put after the diagnosis, the boy called for special examination again and the aid of the private physician or clinic asked for a more complete diagnosis. Slipshod diagnosis is unnecessary.

CONCLUSIONS

1. Such surveys of the 14–17-year age group, made by combined health and educational agencies, to be followed by more detailed studies of correlated findings, are interesting and valuable as they fill a gap in medical knowledge between infancy and childhood on the one hand and adult life on the other.

2. The very strong effort to enlist the coöperation of the private physician and clinic in this work, and especially the plan of the Kings County Medical Society's coöperation is an advance in the relation of public and private medicine.

3. This age group of 14–17 presents certain problems of weight, growth, nutrition, low mortality and morbidity, with lack or very low incidence of certain diseases, that are peculiar to itself.

4. Physicians in this work must be conversant with these facts and also specially trained in physical examination and diagnosis as are specialists in pediatrics.

5. Standards of physical examination, diagnosis, and recording of results are necessary, especially when numbers of examiners are involved, to procure comparable results. To this end are necessary: (1) definite training in the scope and method of the physical examination; (2) a thorough understanding of the psychology of the group; (3) a knowledge of its statistics and comparative statistics; (4) a use of the diagnostic sheets; (5) weekly checking of defects on such sheets; (6) conferences with the supervisor to check percentages of defects found and to discuss problems arising; (7) frequent consultations between the doctors during examination of any doubtful diagnosis; (8) reference to private physician or clinic for X-ray or other laboratory measures for additional or corroborative information; (9) special training in clinics, as necessary, to perfect diagnosis; and (10) realization that this work needs expert and patient diagnostic ability and that slipshod diagnosis is unnecessary and wasteful.

6. Our 14–17-year group is in a period of rapid growth in size and weight and shows great resistance to disease; the incidence of most infectious diseases is very low; heart, lung, chronic nervous disorders, gastric and intestinal conditions, and even venereal affections, are all low or largely lacking.

7. In the Manhattan study, 13.2 per cent were normal; 25.5 per cent, if we except unclean teeth as a defect. In the Brooklyn study, 12.8 per cent of 728 were normal; 25.6 per cent, not counting unclean teeth.

8. In Manhattan, on the 6-month complete reëxamination of 485 boys, the original 1,223 defects were found reduced by 583, or 47.7 per cent.

9. Only 2 cases of gonorrhea in 2,691 boys or 0.3 per cent were found in Manhattan, and only 5 or 0.1 per cent in 4,661 by 4 physicians in Brooklyn. No case of acquired syphilis was seen in Manhattan and 2 in 4,661 by four physicians in Brooklyn. Cases may have escaped the examiners, but the incidence of gonorrhea and syphilis must be low.

10. Constipation was found in 26 or 1 per cent in Manhattan, and in 2.9 per

cent in 728 and 2.4 per cent in 2,940 by four doctors in Brooklyn. The condition is relatively uncommon, and when it occurs, not severe, but usually intermittent. In Brooklyn, 97.4 per cent of the boys reported 1, 1-2, or 1-2-3 movements daily. Acute appendicitis was diagnosed only once, chronic, 3 times in Manhattan. This infrequency of appendicitis is interesting in relation to the low incidence of constipation.

11. As regards tuberculosis, there were only 2 active cases in Manhattan and 3 among 3 doctors in 2,490 boys in Brooklyn. In Manhattan, 3.3 per cent were found suspicious of possible old healed pulmonary tuberculosis.

12. As regards the heart, 1.1 per cent showed chronic valvular disease. In Brooklyn, 3.3 per cent of 728; three other physicians, 1.5 per cent, 1.2 per cent, 3.2 per cent or 2.5 per cent in 2,940 by four. In Manhattan, there were 0.4 per cent of cardiac anomalies, in Brooklyn, 2.7 per cent, 1.5 per cent, 2.0 per cent, and 3.2 per cent or 2.2 per cent for four. In Manhattan of 40 cases of murmurs, 27 per cent were not regarded of chronic valvular disease; in Brooklyn, of 136, 45 per cent were not regarded of chronic valvular disease.

13. Of 3,387 boys in Brooklyn, 1,049 or 30.9 per cent smoked and, of these 1,049, 32 per cent smoked to excess. Practically all used cigarettes and most inhaled, a few had smoked from the age of 6 or 7 years, and some were found using 30, 40 or 50 daily.

14. Despite the facts that this 14-17-year group shows comparatively low incidence of gonorrhea, syphilis, constipation, tuberculosis, diabetes, heart disease, cancer, arteriosclerosis, nephritis, and occupational disease, all these usually serious conditions will mount to their acmes during full adult and industrial life; that despite their low incidence, we still can find 6,532 defects of 234 varieties in 2,691 boys, and 7, 8, or more defects in a single boy. It becomes evident therefore that this peculiar period calls for the strict application of the modern principles and practices of preventive medicine and health education. Through a knowledge of such defects and by educational and practical medical measures we may then in these young workers discover seeds already planted for tuberculosis, heart disease and other maladies or uncover a soil waiting and ripe for future seeds, and then, like careful and expert gardeners, destroy the seeds or improve or alter the soil that the later scourges will fail to grow.

REFERENCES

1. *United States Abridged Life Tables, 1919-1920*. U. S. Bureau of the Census. Part 1, Table 3, pp. 12-13.
2. Minot, C. *Age, Growth and Death*, 1908, p. 111.
3. Sydenstricker, E. *The Causes of Illnesses at Different Ages*. Hagerstown Morbidity Studies No. vii. Reprint No. 1225, U. S. P. H. S., 1928, p. 6.
4. Brunet, W., and Edwards, M. A Survey of Venereal Disease Prevalence in Detroit. Reprint 6, U. S. P. H. S., 1927, p. 5.
5. Deacon, W. A Statistical Study of 60,000 Cases of Venereal Disease. *Venereal Disease Bull.*, No. 79, U. S. P. H. S., 1925, p. 5.
6. Sydenstricker, E. *The Incidence of Various Diseases According to Age*. Hagerstown Morbidity Studies No. viii. Reprint No. 1227, U. S. P. H. S., 1928, pp. 5 & 25.
7. Metropolitan Life Insurance Co. *Stat. Bull.*, XI, 7 (July), 1930.
8. Drolet, G. J. Epidemiology of Tuberculosis in New York City. *J. Prev. Med.*, 4, 2: 115-138 (Mar.), 1930.
9. Chadwick, H. D. *Case Findings as Practiced in Massachusetts*. National Tuberculosis Association. New York, 1930, p. 26.
10. Bolduan, C. Tuberculosis Still a Major Problem. *Weekly Bull.*, New York City Dept. of Health, XIX, 23: 182-184 (June 7), 1930.
11. Metropolitan Life Insurance Company, New York. Personal communication.
12. Cahan, J. M. The Incidence of Heart Disease in School Children. *J. A. M. A.*, 92, 19: 1576-1578 (May 11), 1929.

13. Bainton, J. H. *Heart Disease & School Life*. American Heart Association, Inc., New York, p. 6
14. Whitney, S. *Heart Disease Mortality Statistics* (United States Registration Area), Table VI. American Heart Association, New York, 1927.
15. *Report of the Committee to Make a Study of Heart Disease in the State of New York of the Medical Society of the State of New York*. American Heart Association. New York, 1928, p. 119.

NOTE: The standard form for history taking and physical examination, also complete and comprehensive tables covering all findings and deductions, are available upon request to Dr. Jerome Meyers, 41 W. 83d St., New York, N. Y.

Hydrocyanic Acid Fumigation

HYDROCYANIC acid gas is our nearest approach to the ideal fumigant. Confined in inclosed spaces, quite small amounts destroy all animal life therein; but when liberated in the open air its dissipation is so rapid that it requires very large quantities to produce fatal results in human beings. . . . The gas is very penetrating. . . . It will penetrate into the center of a sack of flour in about 2 hours; and if the concentration is maintained sufficiently high, enough gas will penetrate a sack of flour in 6 hours to kill weevils. Highly porous material is very rapidly penetrated by this gas—a fact of considerable importance to fumigators, since the gas penetrates their clothing almost at once.

Penetration being merely one feature of diffusion, it is not surprising to find that the gas also rapidly passes out of materials it has penetrated. A comparatively short stay in the open air will remove most of the gas from fumigated articles. An hour's airing, for example, renders a mattress safe to sleep on, unless an excessively heavy concentration of gas has been used. Water, however, absorbs hydrocyanic acid and holds it, particularly in cold weather, so that after fumigation, moist articles require longer airing than dry ones. Ordinarily, gas absorbed by collections of water is given off so slowly that it is not dangerous; but occasionally a relatively large amount is taken up on a cold day, and when a warm day follows, the gas is then given off more rapidly. One or two accidents on ships have been attributed to gas absorbed and later released from bilge water under such circumstances. On one occasion the ship passed into the warm waters of the Gulf Stream.

. . . Foods absorb the gas, but not in dangerous quantities from the concentrations generally used in building fumigations. It is well, however, to air fumigated foods for two or three hours before eating them. Foodstuffs fumigated in fumigation chambers with high concentrations of this gas (10 to 20 oz. HCN per 1,000 cu. ft.) should be aired at least 24 hours.

Hydrocyanic acid gas is not injurious to the vast majority of the articles of commerce. In the concentrations used for ship fumigations to kill rats it is not injurious to any known material, including such delicately flavored commodities as tea and tobacco. This is a very important consideration and one of the dominating ones in the establishment of this gas as a fumigant. In heavier concentrations (10 oz. per 1,000 cu. ft.) it is injurious to delicate vegetables, such as lettuce and probably to bananas, interfering with the ripening processes. It probably would kill living foods, such as oysters, although the necessity of fumigating oysters has never arisen. Fumigated eggs usually will not hatch.

. . . Because only small amounts are required, hydrocyanic acid gas is a cheap fumigant, probably the cheapest effective fumigant. For the destruction of rats, only 2 oz. of HCN per 1,000 cu. ft. of space is required. At \$1 per lb., this amount costs \$.12½.—C. L. Williams, *Pub. Health Rep.*, May 1, 1931.

Mortality from Puerperal Septicemia in the United States*

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IT is well known that in practically all countries the death rates from puerperal septicemia, the largest single cause of maternal mortality, have shown little or no tendency to decline during recent years. This is remarkable in the light of present medical knowledge and of improving obstetrical practice. In a previous study¹ by the author of the course of puerperal septicemia mortality, a trend line was fitted to the data of each of a number of states. Though it was observed that these trend lines did not have the same slope, it was impossible to study the causes of this variability because of lack of data. It is possible, however, to determine whether or not the trend of the mortality from puerperal septicemia has been approximately the same for certain broader divisions of the population, namely, urban white, rural white, urban colored, and rural colored.

This was done by analyzing the data published by the U. S. Bureau of the Census in *Mortality Statistics* and *Birth, Stillbirth and Infant Mortality Statistics* for successive years from 1922 (the year in which the continuous tabulation of stillbirths began) to 1927 inclusive. All the states that were in both the death and the birth registration area for the entire period 1922-1927, were combined into a group or unit for which it was desired to assemble information:

California
Connecticut
Delaware
Illinois
Indiana
Kansas
Kentucky
Maine
Maryland
Massachusetts

Michigan
Minnesota
Mississippi
Montana
Nebraska
New Hampshire
New Jersey
New York
North Carolina
Ohio

Oregon
Pennsylvania
Rhode Island
Utah
Vermont
Virginia
Washington
Wisconsin
Wyoming

For certain divisions of the total population of this unit the total

* Read before the Vital Statistics Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

TABLE I

MORTALITY FROM PUERPERAL SEPTICEMIA, COMBINED STATES, WHITE POPULATION

Year	Urban			Rural		
	Total Births	Deaths from Puerperal Septicemia	Deaths per 1,000 Total Births	Total Births	Deaths from Puerperal Septicemia	Deaths per 1,000 Total Births
1922	873,288	2,279	2.61	784,663	1,373	1.75
1923	896,292	2,508	2.80	776,431	1,363	1.76
1924	921,738	2,451	2.66	788,527	1,324	1.68
1925	898,943	2,462	2.74	757,993	1,201	1.58
1926	883,164	2,340	2.65	729,384	1,221	1.67
1927	889,169	2,358	2.65	729,782	1,149	1.57

births (live births and stillbirths) and the corresponding number of deaths from puerperal septicemia were obtained, suitable combinations being made where necessary, from the government publications for each year of the period 1922-1927. With this information, death rates were next calculated. These were expressed as the number of deaths from puerperal septicemia per 1,000 total births, a method discussed and advocated by both Howard² and Hemenway.³ The class "total births" includes, of course, both living births and stillbirths.

The results of this analysis are presented in Tables I and II and Figures I and II. As defined by the U. S. Bureau of the Census, "urban" is descriptive of the population living in cities which had 10,000 inhabitants or more in 1920, and "rural," of the population living in places which had less than 10,000 inhabitants in 1920. It

TABLE II

MORTALITY FROM PUERPERAL SEPTICEMIA, COMBINED STATES, COLORED POPULATION

Year	Urban			Rural		
	Total Births	Deaths from Puerperal Septicemia	Deaths per 1,000 Total Births	Total Births	Deaths from Puerperal Septicemia	Deaths per 1,000 Total Births
1922	46,727	220	4.71	81,332	223	2.74
1923	52,238	267	5.11	81,110	225	2.77
1924	59,270	264	4.45	82,599	254	3.08
1925	59,780	300	5.02	81,479	231	2.84
1926	60,040	277	4.61	81,566	189	2.32
1927	62,177	320	5.15	79,915	225	2.82

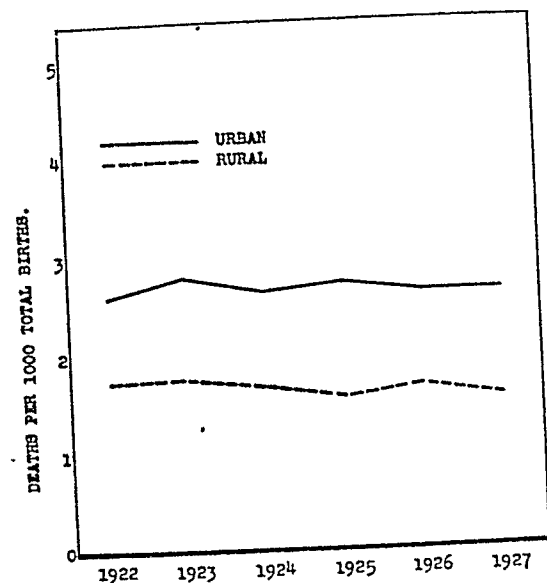


FIG. I. DEATH RATES FROM PUERPERAL SEPTICEMIA, COMBINED STATES, WHITE POPULATION, 1922-1927.

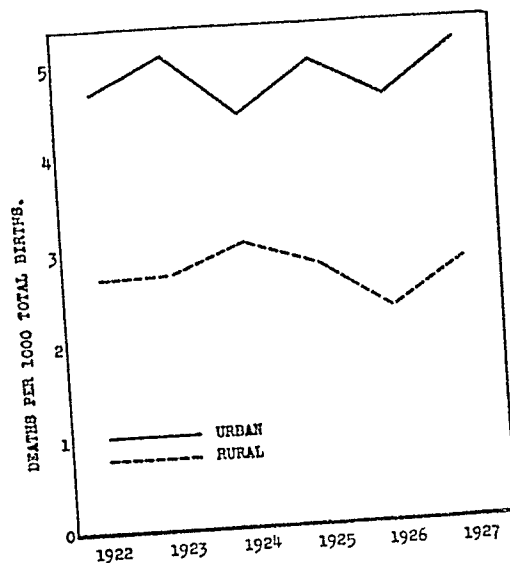


FIG. II. DEATH RATES FROM PUERPERAL SEPTICEMIA, COMBINED STATES, COLORED POPULATION, 1922-1927.

will be seen by a study of these tables and figures that there certainly has been no tendency for the rates to decline in the urban white, urban colored, and rural colored divisions of the population. For the rural white division, however, the rates have had a very slight tendency to decline, but in view of the shortness of the period studied this is probably without significance. (The rates for the rural part of the population have been always less than those for the urban part. This is true for both the white and the colored group. The death rates for the colored population have been always higher than those for the white population in both the urban and rural sections.)

Attention will now be directed to another aspect of the problem. Is there any association between the magnitude or trend of the death rates and aggregation of population as judged by the size of city in which people live? In tabulating the data for the urban population of the combined states with the addition of Washington, D. C., to obtain some information upon this point, it seemed preferable to make the classification of cities as to size depend upon the number of total births recorded in 1922 rather than upon the total population in 1920. Accordingly, those places which had a population of 10,000 or more in 1920 were classified into 3 groups: all having fewer than 700 total births in 1922; all having from 700 to 2,000 total births in 1922; and all having 2,000 or more total births in 1922. The results are set forth in Table III. It will be seen that there has been no definite tendency for the death rates for any of these 3 sub-divisions of the combined urban population to decline. (The rates, however, tend to be lowest in the group of large cities.)

TABLE III

MORTALITY FROM PUERPERAL SEPTICEMIA, COMBINED STATES, TOTAL URBAN POPULATION

Year	Cities Having Fewer than 700 Total Births in 1922			Cities Having from 700 to 2,000 Total Births in 1922			Cities Having 2,000 Total Births or More in 1922		
	Total Births	Deaths from Puerperal Septicemia	Deaths per 1,000 Total Births	Total Births	Deaths from Puerperal Septicemia	Deaths per 1,000 Total Births	Total Births	Deaths from Puerperal Septicemia	Deaths per 1,000 Total Births
1922	157,356	458	2.91	156,811	477	3.04	615,414	1,594	2.59
1923	163,505	493	3.02	165,274	569	3.44	629,225	1,751	2.78
1924	169,599	445	2.62	173,291	570	3.29	647,851	1,753	2.71
1925	165,631	510	3.08	169,245	566	3.34	633,398	1,723	2.72
1926	163,258	495	3.03	166,276	503	3.03	623,033	1,647	2.64
1927	165,050	497	3.01	168,299	489	2.91	627,488	1,726	2.75

These findings may be summarized by the statement that, for the period studied, with the possible exception of the rural white division, the death rates from puerperal septicemia have not declined in any of the divisions of the population considered, and furthermore that the rates for each division have remained remarkably constant.

REFERENCES

1. Harmon, G. E. The Course of Mortality from Puerperal Septicemia for Certain States of the United States, 1900-1920, *A. J. P. H.*, 14, 3: 214 (Mar.), 1924.
2. Howard, William Travis. The Real Risk-Rate of Death to Mothers from Causes Connected with Child-birth, *Am. J. Hyg.*, 1: 197 (Mar.), 1921.
3. Hemenway, Henry Bixby. Tabulation of Maternal Deaths, and Causes of Stillbirths and Deaths of Very Young Children, *A. J. P. H.*, 19, 12: 1334 (Dec.), 1929.

Septic Sore Throat

AN explosive outbreak of septic sore throat involving over 450 cases, with 4 deaths; is reported. The epidemiological evidence establishes that the source was infected milk from one dairy.

The attack rates in households exposed vary from 38 per cent in the 10-14 year old groups, to over 60 per cent in the group of 20-30 years. The vast majority of infected families showed multiple cases. Suggestive but inconclusive evidence is given that the cow was infected by human carriers of the causative agent of scarlet fever.

The epidemic was controlled by stopping the sale of unpasteurized milk.—McKay, A. L., and Hardman, R. P., A Septic Sore Throat Epidemic, *Canad. Pub. Health J.*, May, 1931.

Immunization of Dogs against Rabies by the One-Injection Method*

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VACCINATION as a prophylactic against rabies in dogs, developed by the Japanese investigators, Umeno and Doi,¹ has had extensive use in the United States following its introduction into the country by Eichhorn and Lyon, in 1922.² Some idea of this can be gathered from the fact that, from 1923 to July 1, 1930, approximately 2,000,000 doses of this type of vaccine have been prepared by commercial houses operating under Federal Veterinary License.

The original vaccine of Umeno and Doi was a fixed virus attenuated by phenol and contained 20 per cent of brain tissue. As this contained living virus and was found capable of producing the disease,³ a feature highly objectionable in a prophylactic vaccine, its use was discontinued and its place taken in recent years by those killed by chemicals or rendered avirulent to such an extent as to be incapable of producing the disease when injected subdurally into rabbits.

There has been considerable discussion as to the merits of the one-dose vaccine and a variety of opinions have been expressed. The points to be considered in evaluating the vaccine are: (1) Does it immunize? (2) Is it safe? (3) How long does immunity last?

Does it immunize? The vaccines considered are those in use in the United States at present. There are two commercial types, one phenol treated, and the other chloroform treated, both of which are either killed, or are avirulent to such an extent that they cannot produce the disease under the most severe test—subdural injection into rabbits. It is held by some that a dead virus has no immunizing properties and that a vaccine consisting of a dead virus is impotent. Animal inoculation is the only test for viability now available and until new methods are at hand a differentiation cannot be made between a virus that is destroyed and one that has been rendered completely avirulent, but is still living.

The phenol-treated vaccines contain from 10 to 20 per cent of brain

* Read before the Laboratory Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 29, 1930.

tissue, while the chloroform-treated contain $33\frac{1}{3}$ per cent brain material.

Experimental tests in 1928-1929⁴ showed that of 12 dogs treated with the phenol vaccine and later exposed to street virus by intramuscular injection, 5, or about 40 per cent, died of rabies, while of 11 controls, 9, or about 80 per cent, contracted rabies—a decided difference in favor of the vaccinated dogs. It was also noted that deaths of the vaccinated dogs occurred among those treated with particular lots of vaccine. In other words, while the number of cases was small there appeared to be a difference in potency in lots of vaccine prepared in the same manner. It would seem that phenol vaccines in general are capable of producing a reasonable degree of immunity in dogs, but that failures are to be expected at times.

Of practical importance in the field use of the vaccine is the question of the plurality of types of the virus of rabies. Are there types that are immunologically different? The fixed virus from which vaccines are made in this country is a single strain, found on inquiry some years ago to have had its origin in the Pasteur Institute of Paris, France. Do types of street virus exist against which the vaccines made from the standard fixed virus cannot immunize? It is accepted that there is a marked variation in the virulence of different strains of rabies virus, and while the unity of rabies virus is generally held, suggestive evidence has been presented at times to indicate the possibility of the existence of more than one type.⁵ The writer encountered a strain several years ago against which apparently little immunity in dogs could be produced. This has been studied in the laboratory and possesses a marked characteristic not seen with other strains of street virus—the amazingly great number of Negri bodies regularly found in smear preparations from the hippocampus. This characteristic has been preserved over a period of years and after a large number of passages in the rabbit. Further immunity studies with this strain are contemplated.

Failures of the vaccine in the field have been noted. These can be explained on the basis of the failure of the vaccine to induce an immunity or to exposure of the animal to a type of street virus immunologically different from the standard fixed virus. Until proof has been produced experimentally as to the plurality of the rabies virus, this question must remain unsettled.

Experimental work on the potency of chloroform-treated vaccines has been highly encouraging. In 1929⁴ we showed that of 9 dogs treated with this type of vaccine, all survived exposure to a street virus injected intramuscularly which was sufficiently virulent to cause rabies

in 11 of 13 control dogs. This product has only recently been placed on the market and no data are available on its efficacy under field conditions. Recent work by Kelser with the chloroform-treated vaccine showed a high degree of potency when tested on rabbits.⁵

Is the vaccine safe? The phenol-killed vaccine, if prepared properly, is incapable of producing rabies, as it must before release be shown not to contain virus capable of producing the disease on subdural injection in rabbits. However, there is a certain element of danger that should be recognized. This is a paralysis somewhat similar to that seen occasionally in man following antirabic treatment. In man it has been noted that paralysis is less apt to occur when vaccines which have been attenuated or killed by phenol are used. It is believed probable from the number of cases reported experimentally⁶ that the dog is more susceptible to vaccination paralysis than man, although exact figures are lacking. Most of the cases of paralysis appear from within a few days to several weeks after vaccination and the majority of cases result in complete recovery, although the termination may be fatal. Cases of paralysis have been noted in experimental work and also following the field use of vaccine.

The chloroform-treated vaccine, like the phenol-treated, if prepared properly cannot produce rabies. Experimentally, no cases of paralysis have been observed in 30 dogs vaccinated with this product by the writer. The vaccine has been used on approximately 150 dogs at one of our army posts to date with no unfavorable reactions. Just how this vaccine will act under field conditions remains to be seen.

There is a possibility that vaccination may produce for a short period a temporary negative phase during which a dog may be more susceptible to infection than one not vaccinated. This was suggested by limited experimental work reported in 1928.⁷ It would appear to be a safe procedure to keep vaccinated dogs in quarantine for 2 or 3 weeks to observe the effects of vaccination and to keep them from possible exposure until immunity has become established.

How long does immunity last? Experimental data have been presented by several workers which indicate that the original Japanese vaccine induced immunity that persisted from some months to 1 year, and that it was apparent after 1 month. Data in respect to phenol-killed vaccine are quite meager. The writer encountered 1 dog which resisted infection 1 year after vaccination. Immunity should not be considered in any event to last more than 1 year, and in some cases it may endure for a shorter time.

No data on chloroform-treated vaccine are available beyond 4 months.

DISCUSSION

It would appear that phenol-killed vaccines are capable of producing immunity in dogs when given in 1 dose, but also that failures of this type of vaccine are to be expected, and a false sense of security should not obtain because of vaccination.

The possibilities of post-vaccinal paralysis with this type of vaccine should be recognized and no absolute assurance should be given that no harm to the dog will result.

From the data available it appears that the chloroform-treated vaccine is superior to the phenol vaccine in both potency and safety, but final judgment must await its use in the field.

Many favorable results have been reported with the use of vaccination in conjunction with other standard control measures in combating outbreaks of rabies in the field. The reduction of the susceptibility of a dog population to rabies infection is a step forward in the control of the disease, but the rigid enforcement of such standard measures as the destruction of stray dogs and quarantine is absolutely necessary for the solving of the rabies problem.

REFERENCES

1. Umeno, S., and Doi, Y. A Study of the Anti-Rabic Inoculation of Dogs and the Results of its Practical Application, *Kitasato Arch. Exper. Med.*, IV, 89, 1921
2. Eichhorn, A., and Lyon, B. M. Prophylactic Vaccination of Dogs Against Rabies, *J. Am. Vet. Med. Assn.*, LXI, 14: 38, 1922
3. Schoening, H. W. Studies on the Single Injection Method of Vaccination as a Prophylactic Against Rabies in Dogs, *J. Agri. Res.*, XXX: 431, 1925.
4. Schoening, H. W. Experimental Studies with Killed Canine Rabies Vaccine, *J. Am. Vet. Med. Assn.*, LXXVI, 29: 25, 1930.
5. Kelsner, R. A. Chloroform-Treated Rabies Vaccine, Presented at the Sixty-seventh Annual Meeting of the American Veterinary Medical Association, Los Angeles, Calif., Aug. 25-29, 1930. Since published *J. Am. Vet. Med. Assn.*, LXXVII, 30: 595, 1930.
6. Verge, J., and Pham Van Huyen. Recherches sur la vaccination Antirabique du chien, *Recueil de Méd. Vét.*, C VI, 5: 249 (May), 1930.
7. Schoening, H. W. Experimental and Field Results of the Single Injection Canine Rabies Vaccine, *Cornell Vet.*, XVIII, 2: 105, 1928.

Comfort in Temperature and Humidity

THE record shows that in the experiments as a whole from 91 to 97 per cent of the group found 70° F. comfortable, irrespective of the humidity. . . . While the optimum humidity seemed to be 55 to 60 per cent, it may be concluded that in an auditorium kept at the standard temperature of 70° F. variations in humidity between the limits used, which are those that ordinarily prevail indoors in temperate climates under winter conditions, make but little difference in the sense of comfort and well-being of the occupants. It is doubtful, therefore, whether there is any justification for the installation of expensive equipment for the control of humidity. For such conditions the dry bulb temperature is the important standard to maintain, together with provision for the renewal and adequate movement of the air.—W. H. Howell, *Science*, Apr. 24, 1931, p. 455.

Birth Records of Illegitimates and of Adopted Children*

Part I

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Part II

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SEEMINGLY no better conception of the existing conditions surrounding illegitimacy in this country, and of the more or less progressive legal steps taken by our various states in connection therewith, can be obtained for consideration, than in Dr. Marietta Stevenson's "Analysis and Tabular Summary of State Laws Relating to Illegitimacy in the United States, in effect January 1, 1928, and the Text of Selected Laws," as set forth in 1929 in "Chart Number 16" of the Children's Bureau of the U. S. Department of Labor.

The pithy first paragraph of this article summarizes most effectively the present status of unlawfully born children:

Birth statistics are incomplete and no one knows exactly how many children are born out of wedlock in the United States each year. It was reported, however, that 55,134 children were born out of wedlock in the states included in the registration area in 1927 (exclusive of California and Massachusetts, for which illegitimacy statistics were not available). The population of the registration area exclusive of these states comprised more than two-thirds of the population of the United States. It is known that the percentage of illegitimate births is much higher in some states than in others, higher in the city than in the country, and higher for the negro than for the white race. Many of the mothers are pathetically young and are handicapped oftentimes in other ways. It is estimated that about half the mothers are under 20 years of age, and a large proportion of the remainder under 25. The fathers also are quite often mere boys. Considering the problem of illegitimacy from the standpoint of the child, his mother, his father, and society, the need for humane, comprehensive, and constructive laws for safeguarding the rights and insuring the fulfillment of the obligations of the four parties interested becomes clear.

* Read before the Vital Statistics Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

† Deceased.

Dr. Stevenson's treatise is a noteworthy accomplishment. It succinctly lays before us the *legal gains* which have already been made by the states in behalf of this unfortunate class along the lines of rights and obligations of parents, action necessary to establish paternity and legitimation, and child's rights of maintenance and inheritance or succession. It contains, as well, some very timely and inspiring comments which should generate within all the determination to do our utmost to insist on equally rational treatment of the inhumane features of the problem, which, under present custom, continue to exist as hindrances to the well-being of each illegitimate child long after all statistical requirements are satisfied and all legal redress secured.

Doubtless many of us directly concerned with the work of registration of births, under statutes patterned closely in accordance with the so-called "Model Law," experienced a hopeful thrill as we came in contact with Dr. Stevenson's analysis and read these words:

The old unscientific point of view, evidently inspired by moral indignation, expressed itself in legislation meant to punish and stigmatize the unfortunate child and his mother. *The modern aim is instead to protect and care for the child.* Much of the legislation is in an experimental stage, but certain tendencies are discernible, *the result of a growing feeling that the child born out of wedlock unavoidably suffers enough disadvantages without emphasizing these by legislative discrimination.*

In that paragraph, it seems, is the keynote—the guidon which we should follow, until the sorely needed modern legislative measures suited to the "growing feeling" are enacted, and are accorded liberalized administration.

Registrars, as birth record keepers, from a statistical standpoint, know that the factor of illegitimate births has no inconsiderable bearing on the distortion of their returns with respect to bona fide area of inception. A high percentage of such births are recorded at places other than the "usual abode" of the mother. The very character of these births has a marked tendency to inhibit their being reported at all. Would not legal provision for the recording of foundlings under a plan, similar to that mentioned further on, improve the "Degree of Completeness of Birth Registration"?

So much for the statistical aspects—but what of such cases in relation to their individual rights as members of society?

Turning again to the Stevenson analysis, we read that at a regional conference of the Children's Bureau, in 1920, "The duty of the State to protect the interests of children born out of wedlock was recognized and affirmed," and "the numerous laws defining the relationship of the

illegitimate child to his parents and placing a duty of support upon the father, especially laws passed in the last 15 years, are indications of a changing social attitude." So far, so good—the legal rights of these unfortunate children, as they became apparent to the public mind, have been fairly well established. But what of their social rights?

Unquestionably, the establishment of the illegitimate child's rights was, and still is, the first consideration—it must so be for the protection both of the child and the State, especially in cases where one or both parents are known. Naturally and logically then, the adjustment of the legal phases of such cases has occupied the major portion of the time and effort of child welfare bureaus, as is reflected by the character of the enacted laws. Under the old order of things such legal adjustment was sufficient, and accordingly helpful legislation was not developed further.

The old order has given way to the new, and although formerly the statements of the child or its parents as to name, age, and relationship were accepted; now the presentation of a duly authenticated birth certificate has become an almost universal prerequisite for admittance to school or employment, or for foreign travel. Small barrier, this, to the legitimate child or his parents who have merely to apply for a certified copy or a transcript of the birth record—but what of the illegitimates, adopted children, and foundlings?

These and their foster parents or guardians are apt to find themselves in a predicament, for if they are successful at all in securing a record of the birth, that very act may carry with it most distressing revelations likely to permanently impair otherwise peaceful mental conditions and happy lives. Where can we find the remedy?

Again we are encouraged by the hopeful rays which appear to light the pathway of our search when we note from the "Analysis" a tendency on the part of some states, such as Iowa and North Dakota, to minimize the broadcasting of distressing trial details by statutory exclusion of the public, or vest the power of such exclusion, as in New York and Minnesota, in the trial judges.

We are further heartened by finding among the Statutes of Colorado (Laws of 1925, ch. 133—Maternity Hospitals) that the divulgence or disclosure of the contents of any records relating to illegitimate children is prohibited.

We are convinced that our attitude is right when we read in Section 7 of this Colorado Act:

That this chapter shall be liberally construed with a view to effecting its purpose which is primarily to safeguard the interests of illegitimate children, and those

of undetermined legitimacy born in maternity hospitals as herein defined, and secure for them the nearest possible approximation to the care, support and education that they would be entitled to receive if born of lawful marriage, which purpose is hereby acknowledged and declared to be the duty of the State.

In the words "secure for them the nearest possible approximation to the care, support and education that they would be entitled to receive if" lies the sought for antidote. True, it is there only in embryo as it were, not specifically expressed by the addition perhaps of the words "and rights of citizenship," following the "care"—"support"—"education" benefits now provided. Nevertheless it is inconceivable that the Colorado Legislature could have had other intent than that these unfortunates should be equally vested with the "inalienable constitutional rights" of "life, liberty and the pursuit of happiness," as are children legitimately born. Now, in the light of dawning consciousness of the social factors mentioned, and in the discernibly favorable crystallization of public opinion indicating that the time is ripe for action, how can this be accomplished so thoroughly, humanely and sensibly that it will practically insure for these children immunity from unnecessary embarrassment, pain, or disgrace, from the time of the launching of their individual careers—their advent into school or employment?

Clearly it is most desirable to secure such legislation as will authorize and enable bureaus of vital statistics or other custodians of birth records to include among their functions, subsequent to the taking of required statistical data, the suppression of such original records or statements of facts as may have become nullified, readjusted or supplanted through legal procedure accomplished after the time of registration.

As members of this Association primarily concerned in the record keeping which is a counterpart of birth registration, both in our respective states and at the U. S. Bureau of the Census—we seem to be, logically, the missionaries who should bring about the rectification of the existing evils. If we are registrars of vital statistics, ours is a dual rôle—on the one hand, as statistical craftsmen we must insist on the accuracy of the basic data, but on the other, in serving the public we must do all possible to furnish only such copies of birth records as will best promote the welfare of the persons concerned.

Due to our unique positions, we are best qualified to act. It is signally fitting, therefore, that we should take the lead in this matter, and accordingly the following plan of my associate and collaborator is respectfully submitted for consideration:

Legitimation, Adoption and Foundlings

Registrars of vital statistics are guardians and trustees of the interests of the people. This is peculiarly true in relation to records of birth.

In drafting the "Model Law" for the registration of births, stillbirths and deaths, three very important classes of cases were apparently entirely overlooked, namely cases of legitimation of birth, those of adoption, and those of foundlings. In consequence many children are often unjustly stigmatized as bastards, and the birth records of adopted children frequently cannot show their legal names by adoption. In many cases of adoption there is also the stigma of bastardy. A foundling has no birth record.

When a child begins to attend school in many states he is required to present evidence that his birth has been recorded. A certificate for "John Jones" is not satisfactory in the case of a boy legally known as "John Miller." It must be accompanied with other evidence showing illegitimate birth, or legal adoption, or both. This not only is a direct injury to the child, and a cause of embarrassment for parents, but seriously interferes with the placing of children in desirable homes.

The statutes of the states relative to these subjects vary. Minnesota, for example, provides for reporting cases of legitimation to the vital statistics office; but in a certified copy of birth record, it does not prohibit the certification of illegitimate birth.

The statutes of Illinois may be considered typical for the country at large, and are therefore taken as the basis for this presentation, in order that specific sections may be cited. With slight changes in wording the recommendations would apply for many other states.

A common law marriage is not recognized in Illinois. It is illegal, and births from such unions are therefore illegitimate. Chapter 89, Smith-Hurd Statutes of Illinois, Section 17(a), however, provides that although the marriage may have been contrary to law, if the parents "have attempted to contract and be joined in marriage, and some form of marriage ceremony recognized by law has been performed in apparent compliance with the law in relation to marriage," the issue of such union "is hereby made legitimate and may take the name of the father, though such attempted marriage is declared void or might be declared void for any reason."

Chapter 39, Smith-Hurd Statutes (relative to descent of property), in Section 3 says:

An illegitimate child, whose parents have intermarried and whose father has acknowledged him or her as his child, shall be considered legitimate.

Chapter 17 (relative to Bastardy) in Section 15 provides:

If the mother of any bastard child, and the reputed father shall at any time after the birth intermarry, the said child shall, in all respects, be deemed and held legitimate and the bond aforesaid be void.

There is no provision in the statutes for reporting such acts of legitimation to the vital statistics office, and the Attorney General has held that the Registrar has no authority to accept such documents when offered, nor to permit a change in the record of illegitimacy.

The Illinois Vital Statistics Act, Chapter 111½, Section 48, prohibits that a certificate of birth for an illegitimate child shall

. . . contain the name or other identifying fact relating to the father or reputed father or to the mother thereof, without the consent of said father or reputed father to the use of his name, nor the use of the name of the mother without her consent to the use of her name.

Under present statutes the birth registration of illegitimates is therefore frequently very defective from a statistical standpoint.

It is therefore suggested that vital statistics acts be amended by providing that in case an affidavit is presented to the State Registrar, signed by the father, acknowledging the paternity of the child, and the fact of place and date of his legal marriage to the mother of the child, a new certificate of birth may be filed which shall be considered as the record of birth; and it should further provide that the original certificate of illegitimacy and the aforesaid affidavit shall be placed in a sealed package, only to be opened under orders from a court of record. It should also be provided that in case of marriage of the parents of an illegitimate child before a certificate of birth has been filed, such child shall be considered as legitimate at birth.

Chapter 4 (relative to Adoption) provides in Section 3 that on the filing, hearing and granting of a petition for adoption in the proper Court

. . . a decree shall be made, setting forth the facts and ordering that from the date of the decree the child shall, to all legal intents and purposes, be the child of the petitioner or petitioners, and may decree that the name of the child be changed according to the prayer of the petition.

This section should be so amended as to require that when the name of the child is changed, the clerk of the court shall send an attested copy of the decree to the State Registrar of Vital Statistics. Then on receipt of such copy the State Registrar shall cause to be made a new record of the birth in the new name, and with the name or names of the adopting parent or parents. He shall then cause to be

sealed and filed the original certificate of birth with the decree of the court, and such sealed package shall only be opened upon the demand of said child, or his natural or adopting parents, or by the order of a court of record.

The state has a peculiar responsibility relative to foundlings. The state has not fulfilled its obligation when it provides for their care, food, and clothing. It must also provide for proof of citizenship and age. At present there is no statute in Illinois which requires or even authorizes a legal registration of foundlings. Birth certificates are impossible. When such a child should enter school, attempt to work, try to register as a voter, or require the protection of the government as a citizen, how is he to establish his rights? This question is of greater importance since the registration of all births has been required by law. It seems, therefore, that a statute should be enacted which will require that the *finding* of an unknown child shall be immediately reported to the local registrar of vital statistics; such report to show the sex and color of the child, the date and place of finding the child, and the name of the person or institution with whom it is placed. The city, village, township, or road district in which the child is found should be known as the place of legal birth. Inasmuch as the date of birth is unknown, the report should state such date as nearly as can be determined, and the date so given should be known as the legal date of birth.

The person or institution with whom the child is placed for care should be required to give it a name, and report the same to the local registrar. The "Certificate of Finding" should then be sent to the state registrar, and there filed. If the child should later be identified, and a certificate of birth be found or obtained, such fact should be reported to the state registrar, and indorsed upon the "Certificate of Finding," with citation to the certificate of birth.

RESOLUTION ADOPTED BY THE VITAL STATISTICS SECTION

RESOLVED that in the opinion of this Section, methods should be devised and made legally effective for the correction of birth records of children legitimized, and of adopted children, and also for the registration of foundlings; and be it further

RESOLVED that a committee of five be appointed by the chair to consider and report, at the next Annual Meeting of this Section, the advisability of a uniform or "standard" system for:

1. Acts correcting birth records of illegitimate children subsequently legitimized
2. Acts regulating birth records of children legally adopted
3. Acts for the making of birth records of foundlings

Fungus Infections of Skin of Industrial Workers*

ROBERT T. LEGGE, PH. G., M. D.

Professor of Hygiene, University of California, Berkeley, Calif.

THE medical and public health professions in this country must awake to the realization of the importance of mycotic infections as a causative agency in disease. In a previous paper¹ a plea was made that at least every state hygienic laboratory should have on its staff a trained mycologist to aid physicians, and sanitarium and hospital authorities in the identification and diagnosing of fungus diseases.

Mycotic infections are not strictly confined to dermatology, but are an important factor in internal medicine; the incidence of morbidity being higher among the industrial group. One need only consult the literature to find blastomycotic infections among paper workers, sporotrichosis in gardeners and malt handlers, aspergillosis of the lung common in French pigeon feeders, and actinomycosis among herdsmen and farmers.

On the Pacific Coast, many contributions have been published of fungus diseases among industrial and agricultural workers. Some 134 cases of coccidioidal granuloma² have been reported in California, particularly in and about the San Joaquin valley. Many of these victims were engaged in out-of-door occupations, which suggests that the infection may be present in the soil or upon vegetation. This seems the more probable, as H. J. Templeton's case was a cotton mill hand who probably contracted coccidioidal granuloma from cotton grown in this valley. There was another case of coccidioidal granuloma of the hand following an injury by wire.

On account of the saprophytic nature of the genus *Penicillium* which is so common in nature, workers in out-of-door vocations may contract a pulmonary disease having a mucopurulent expectoration, often bloody, with fever and emaciation; a typical picture of tuberculosis, with the exception of being negative for tuberculosis bacillus. Three such cases came in to our service, which were proved by mycological examination to be broncho-penicilliosis, and which made un-

* Read before the Industrial Hygiene Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

eventful recoveries through the administration of iodides, and the use of autogenous vaccines made from the sputum.

Kingery and Thienes reported, before the American Dermatological Association in 1924, a mycotic paronychia which appeared among workers in fruit canneries of the Northwest. During the pear season the incidence is marked, running as high as 33 per cent. This has been commonly known as "fruit poisoning." There is a marked paronychia, characterized by an inflammatory reaction, pain, swelling, and loss of finger nails. Frequently there is maceration, and cracking between fingers, and vesiculation on the hands and forearms.

H. Sutherland Campbell, of Los Angeles, has observed that certain workers whose fingers came in contact with the pulp or juice while engaged in squeezing cull oranges in the manufacture of orange juice acquired a fungus infection producing a paronychia. The yeast-like organism supposed to cause this infection belongs to the *Mucoraceæ* family.

Recently R. H. M., a painter, was referred to me. He had a severe dermatosis of both hands, and stated that it was due to turpentine. He made application for compensation to the State Insurance Fund, claiming it was an occupational disease. Upon microscopical examination of skin scrapings it proved to be epidermophytosis. Undoubtedly this case was aggravated by the solvents employed in mixing paints, and still may have been a secondary fungus invasion superimposed on a traumatized skin from a coworker carrier, or from his own toe focal infection. Such cases require the keenest judgment on the part of the physician in order to render a fair and impartial decision.

From an industrial point of view, every suspicious skin irritation warrants a careful routine inspection for a possible fungus infection. On account of the universal prevalence of foot ringworm, one can readily see how other parts of the body can be infected, independent of the patient's occupation. We found that 10 per cent of the university students infected with tinea cruris had superimposed a *Trichophyton interdigitale* fungus, undoubtedly carried by the towel when drying the feet and later the groin. Due to this fact, as a public health measure, all bathers when using a towel should always dry the body first and the feet last; the towel then being sent to a steam laundry.

Upon the return of the U. S. Volunteers from the Philippines in 1899 the so-called dhobie itch or "Shanghai foot" was a common infection among the troops, causing much disability, and was a factor in disseminating foot ringworm in this country.

Ringworm of the feet is the most common fungus disease in America today, not only affecting workers in bathhouses and gymnasiums, but also students, clubmen, and the general laity who frequent common showers, swimming pools, hotels, and golf and athletic clubs.

At the University of California during the fall semester, 1928, when the compulsory physical examination was conducted for all freshmen, it was found upon careful examination of the toes that $51\frac{1}{2}$ per cent of the men and $15\frac{1}{3}$ per cent of the women were infected with ringworm. The principal fungus responsible for this common infection is *Trichophyton interdigitale*. Bonar, the mycologist working in our research group, has observed that when replants of a single spore in a culture are made, the resulting growth when aged sufficiently may change in character, making it difficult to identify the morphology of the different types of moulds reported by investigators. Two varieties have been definitely studied that differ in morphology and spore formation. We have been able to determine that the fungus will grow readily in human skin and hair, and in fact any animal tissue, such as wool, silk, bone, horn and leather, and only sparingly in wood, providing some favorable protein is present. We have not been able to grow on media the *Trichophyton interdigitale* from scrapings from shower floors on account of the abundant growth of funguses that crowd out the pathogenic moulds. We are convinced however by the saprophytic nature of the fungus that it multiplies and continues to keep up infection, by the countless skin scales and hairs that are cast or washed off the body during the process of taking a shower or disrobing. The next bather picks up the organisms on his feet, and this is the method of contracting the disease.

The laboratory investigator may be able with certain fungicidal chemicals to destroy the mycelia and spores *in vitro*, but when they are applied clinically it is a different matter entirely, as they may be destructive to the tissues or only affect the epidermis superficially. We have removed thousands of pieces of skin from infected individuals, and proved clinically by culture and microscopic examination that the funguses were present. These bits of infected skin can be soaked in alcohol and sterilized, which will destroy the bacteria and mycelium present, but when they are washed and placed in a plate of sterile Leonians' agar at room temperature, mycelium will appear in a few days, definitely proving that the spores are deeply imbedded in the tissue, and demonstrating the uselessness of many ointments and lotions that are in use therapeutically.

With this important knowledge of the spores' habitat in the living

infected skin, we have tried to determine some fungicidal method for their destruction. For the past 2 years some 26 chemical agents known to dermatologists, mycologists and experimental workers have been studied in our laboratory and clinic, and the ideal specific has not yet been discovered. Among the halogens, iodine in glycerine is efficient; of the stearoptens, thymol 1 per cent or 2 per cent ranks pre-eminent; of the acids, salicylic, benzoic and sulphurous are useful; and among the dyes, crystal, first introduced by the author, gives much promise.

As the result of our researches in cultivating ringworm fungus on all types of animal tissue, such as wool, silk, leather, etc., we advise that all gymnasium clothing should be of cotton or linen, and socks and jock straps of cotton. Woolen socks favor the growth of the funguses, and as laundries do not boil woolen socks on account of the shrinkage a constant source of infection is maintained.

We have demonstrated that a temperature from 75 to 100° C. will destroy the *Trichophyton* spores; which fact is of great public health value in prescribing laundry ordinances.

Three other important problems confront the sanitarian: The first is disinfection of shoes worn by patients who have ringworm; leather, being animal tissue, is a constant nidus for spore multiplication and consequently re-infection to the wearer. We have tried dusting the inside of the shoes with sulphur, which is an excellent fungicide, but it may cause a dermatitis. On account of its lethal and penetrating qualities, 1 per cent thymol dissolved in alcohol or gasoline and poured into shoes, then allowed to drain and dry, seems to be very effective.

The second factor is the disinfection of floors, runways to pools and showers; a most difficult problem. To secure a cheap, reliable, noninflammable and nonodorous fungicide that will not corrode the floors and tiles, and at the same time be nonirritating to bare feet, has been our hardest problem. Every hotel, club and swimming pool manager is intensely interested in securing an ideal disinfectant. Bichloride of mercury 1:1,000 which *in vitro* will kill spores of *Trichophyton interdigitale* in 3 minutes could be added to a floor cleaning compound or solvent, as an effective economical fungicide. Third, to the remote corners of the earth should be broadcast this slogan to prevent ringworm of the feet—

NEVER PLACE THE BARE FEET UPON THE FLOORS
OR SHOWER BATHS IN PUBLIC PLACES.

At the University of California⁵ when the women students' feet were examined upon matriculation, 15 per cent of the freshmen en-

trants had ringworm. On account of the rigid rule that all students must wear rubber bathing slippers when in the gymnasium, pools and showers, the incidence of infection had only increased 2 per cent a year later when reëxamination took place.

An important procedure is suggested in the interest of public health—that when a person uses a public shower and sandals are not available, he step on heavy newspaper or towel when bathing and also when drying the feet.

Hotel keepers are now supplying paper slippers for their guests and the time is ripe for swimming and athletic club managers to supply rubber or wooden sandals for their customers, which after being worn are sterilized by boiling. Such suggestions as these offer the best measures to prevent one of the most important infectious diseases that confront our profession today.

REFERENCES

1. Legge, R. T., Bonar, L., and Templeton, H. J. Ringworm of the Feet, *J. A. M. A.*, 92: 1507, 1929.
2. Cummins. Coccidioidal Granuloma, *California & West. Med.*, Oct., 1928.
3. Kingery and Thienes. Mycotic Paronychia and Dermatitis, *Arch. Dermat. & Syph.*, Feb., 1925.
4. Campbell, H. Sutherland. Paronychia, *Arch. Dermat. & Syph.*, 1929.
5. Legge, R. T., Bonar, L., and Templeton, H. J. Incidence of Foot Ringworm among College Students, etc., *J. A. M. A.*, 93: 170, 1929.

Sir Andrew Balfour

IT seems to me fitting before beginning this lecture that I should also refer to the greatly lamented decease of my predecessor as Hastings lecturer, Sir Andrew Balfour. A year ago Sir Andrew Balfour lectured on the subject which reflected his life's work and interests—namely, 'Health and Empire.' Balfour was of the salt of the earth, capable and efficient in all he undertook, whether it was playing football for Scotland, administering in unhealthy tropical lands, or building up and directing the London School of Hygiene. With these qualities of distinction he was generous and open-hearted in all he did. Hastings and Balfour had much in common, and it is curious to note that just as Hastings, two years before he died, finished off a lecture with these words: 'England, may thou be destined to spread a knowledge of Sanitary Science over the globe: to set an example to other people of obedience to physical laws laid down by the Almighty: and, in the words of Milton's magnificent poem, "to lead the nations in the way of life,"' so also one of Balfour's last duties was to deliver his lecture on 'Health and Empire.'—Edward Mellanby, M.D., *Brit. M. J.*, Mar. 21, 1931, p. 1387.

Training and Personnel*

FOR several years the Committee on Training and Personnel has collected data concerning students registered in schools of public health and the public health degrees granted. The following is the report for the calendar year 1930.

TABLE I

NUMBER OF STUDENTS ENROLLED AND PUBLIC HEALTH DEGREES OFFERED AND CONFERRED IN 1930, IN COURSES REQUIRING AT LEAST ONE YEAR OF RESIDENCE AND LEADING TO A PUBLIC HEALTH DEGREE

School	Degrees	No. Enrolled 1929-1930	No. of Degrees Granted 1930
University of California	A.B.	17	5
	M.A.	1	1
	Dr.P.H.	0	0
	Ph.D.	0	0
Columbia University	M.S.	7	0
	Ph.D.	1	0
	B.S.	3	2
University of Georgia	M.S.	2	1
	Dr.P.H.	4	4
	M.P.H.	12	6
Harvard School of Public Health	Dr.P.H.	1	1
	C.P.H.	31	24
	S.M.	4	—
Johns Hopkins School of Hygiene	Sc.D. in Hyg.	44	14
	Dr.P.H.	5	5
	S.B.	65	8
Massachusetts Institute of Technology	S.M.	0	0
	C.P.H.	6	4
	Dr.P.H.	2	1
	Ph.D.	4	0
	D.P.H.	0	0
	D.P.H.	0	0
McGill University	M.S.	16	4
Queen's University	Dr.P.H.	12	1
University of Michigan	M.A. }	3	1
University of Minnesota	M.S. }	1	0
	Ph.D.	3	1
	M.S.	0	0
Ohio State University	Dr.P.H.	13	12
University of Pennsylvania	D.P.H.	2	1
University of Toronto	M.A.	5	0
	Ph.D.	0	0
	D.P.H.	0	0
University of Western Ontario	Dr.P.H.	8	3
	C.P.H.	2	1
	M.S.	1	1
Yale School of Medicine	Dr.P.H.	11	1
	Ph.D.	—	—
Total		286	102

Total

* Report of the Committee for 1930.

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	M.S.	7	0
Columbia University	Ph.D.	1	0
	B.S.	3	2
University of Georgia	M.S.	2	1
	Dr.P.H.	4	4
	M.P.H.	12	6
Harvard School of Public Health	Dr.P.H.	1	1
	C.P.H.	31	24
	S.M.	4	—
Johns Hopkins School of Hygiene	Sc.D. in Hyg.	44	14
	Dr.P.H.	5	5
	S.B.	65	8
	S.M.	0	0
	C.P.H.	6	4
Massachusetts Institute of Technology	Dr.P.H.	2	1
	Ph.D.	4	0
	D.P.H.	0	0
	D.P.H.	0	0
	M.S.	16	4
McGill University	Dr.P.H.	12	1
Queen's University	M.A. }	3	1
University of Michigan	M.S. }	1	0
	Ph.D.	3	1
	M.S.	0	0
University of Minnesota	Dr.P.H.	13	12
	D.P.H.	2	1
	M.A.	5	0
Ohio State University	Ph.D.	0	0
	D.P.H.	0	0
	Dr.P.H.	8	3
University of Pennsylvania	C.P.H.	2	1
	M.S.	1	1
	Dr.P.H.	11	1
University of Toronto	Ph.D.	—	—
		286	102
Total			

* Report of the Committee for 1930.

TABLE II

NUMBER OF DEGREES IN PUBLIC HEALTH GRANTED IN UNITED STATES AND CANADA 1930

Degree	Degrees Granted	Number of Schools Offering the Degree
Certificate of Public Health	31	3
Doctor of Public Health	13	9
Doctor of Science in Hygiene	14	1
Doctor of Philosophy	1	6
Bachelor of Science	10	2
Bachelor of Arts	5	1
Master of Arts	3	3
Master of Science	7	8
Master of Public Health	6	1
Diploma of Public Health	12	4
Total	102	

Of the above institutions only two have correspondence courses:

	Name of Course	No. of Students
Columbia University (Given through Home Study Department with National Tuberculosis Association)	"Methods and Programs of Tuberculosis Work"	36 enrolled
University of Minnesota	"Elements of Preventive Medicine" given primarily for public health nurses and school health workers	5 (finished course last year)

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U. S. Public Health Station Opened in Mexico City

THE first office of the U. S. Public Health Service to be opened in Latin America has been established in Mexico City at the United States Consulate General under the direction of Dr. Howard Franklyn Smith (major U. S. M. C.), surgeon of the U. S. Public Health Service.

There are 29 similar offices in Europe at American consulates. These are located in districts which are sources of heavy immigration to the United States.

Tuberculosis Death Rates

FIGURES of the tuberculosis death rate compiled by Godias J. Drolet, New York Tuberculosis and Health Association, in 45 large cities for 1929-1930, show a total decrease of 7 per cent in the rate. Only 5 of the number show an increase, and of these, 3 are in the North, and 2 in the South. Very different is the story of the death rate among the colored in 39 large cities. Many of the northern cities had a marked increase for the colored race, New York leading in the increase in the total number of deaths, while Chicago showed a decrease. Memphis, Tenn., and Dallas, Tex., were the only southern cities, geographically, which had a marked increase. In some of the centrally located cities there was an increase in deaths; in others, a decrease. Indianapolis had a decrease of 22, and St. Louis, 17, while Washington, Baltimore, and Cincinnati had marked increases. Mr. Drolet says:

Between 1920 and 1928 the tuberculosis reduction among whites was 12 per cent in the southern cities, 38 per cent in the central cities, and 41 per cent in the northern cities.

Among the colored, deaths from tuberculosis in the 8 southern cities increased in 3 and were almost stationary or declining in the other 5, the net result being an increase from 1,250 to 1,308, namely, by 58 or 4 per cent; in the central cities the tuberculosis mortality among the colored declined in 3 and increased in 5 so that as a net result the mortality of 1920 rose from 1,492 to 1,596 in 1928, or by 6.5 per cent; in the 8 northern cities, in Pittsburgh there were 2 deaths less in 1928 than in 1920, and in all 7 others the mortality increased so that from 2,016 deaths among the colored in 1920 the total rose to 3,209 in 1928 or by 37 per cent. In other words, in the northern cities as against a decline in the number of tuberculosis deaths among whites of 41 per cent we have an increase among the colored of 37 per cent; in the 8 southern cities, the white tuberculosis mortality in its gross total was reduced by 12 per cent but that of the colored rose by 4 per cent.

The cause is not clear, though the tremendous emigration of Negroes from the South to the North, which has taken place during the last few years, probably has something to do with it. Certainly it has been accompanied by much suffering from tuberculosis and in some cities has greatly complicated the tuberculosis problem. However, it seems reasonably sure that when the census returns are available by race, it will be found that the death rate among the colored in northern cities for 1930 is lower than it was in 1920. In other words, in spite of some discouraging figures, there seems to be a distinct improvement in the tuberculosis situation.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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PUERPERAL FEVER

PUERPERAL fever continues to be a blot on the escutcheon of preventive medicine. For some years after the discoveries of Pasteur, it was often said that any physician who lost a case from puerperal fever was criminally responsible. Obstetricians in many countries are awake to the situation, and a good many propositions to avoid infection have been made and tried out. Digital diagnosis of the presentation is avoided by many, but in spite of our efforts, the death rate from puerperal fever still remains high. We have published one editorial on this subject,¹ suggesting that the presence of hemolytic streptococcus in the upper respiratory tract was a probable source of infection.

In Great Britain a number of studies have been made, the most recently published being those in the Hospital for Infectious Diseases of Aberdeen, Scotland. For 8 years, during which 221 cases of puerperal fever and 25 cases of septic abortion were admitted, bacteriological examinations, chiefly of the nose and throat of the attendants, were made, and the patients themselves more completely examined. In 221 cultures from the interior of the uterus, the hemolytic streptococcus was found 149 times, being the only organism present in 120 cases. Blood cultures were positive for this organism in 22.9 per cent of the cases, and only 3 per cent showed the presence of other organisms. It was present in 43 of 46 fatal cases.

In the cases of abortion, the *S. hemolyticus* was found in pure cul-

ture from the uterus in 11 cases. In 3, the *B. coli* was found. It was obtained in pure cultures in 15 of these uterine cultures, and in 12 the source was definitely the nose or throat of the physician, nurse, or student attendant. In one, the infection seemed to be autogenic, there being a focus of infection in the patient's hand. The 3 colon cases originated from the urinary tract or the intestine.

The suggestions made by the investigator and the Department of Health for Scotland, under whose auspices the publication was made, are the wearing of masks by physicians, midwives and nurses, and more careful preparation of the hands.

These studies have been carefully controlled and carry conviction. With our present knowledge of bacteriology and the wonderful advances made along most lines in this science, as well as its practical applications, it certainly seems that we should be able to prevent the maternal mortality which remains so high. Our showing in America is something of which we have no cause to be proud, and any suggestion which holds out the hope of improvement will doubtless be welcomed by practitioners engaged in this line of work.

REFERENCE

1. *A. J. P. H.*, 20, 9: 982 (Sept.), 1930.

UNPROFESSIONAL ADVERTISING

EVERY rose has its thorn. There is an army made up of earnest men and women, some well trained, and some not, conscientiously working for the betterment of health. This is the rose in the picture. The interest of the public in health has been seized upon by advertisers to exploit everything from tooth paste to corn cures, including those diseases which constitute the major tragedies of human life—cancer, tuberculosis, etc. This is the thorn in the picture.

Our newspapers are full of the most preposterous statements, and for some time, supposedly reputable physicians and health officers have lent their names to statements, many of which go beyond knowledge or facts. Not only have our American physicians been selling their names to advertisers, but foreigners have been brought in almost wholesale. In practically every case the advertisements state that these men are "noted," "famous," or "experts." Now and then they get hold of people who are actually well known, and who should know better than to lend themselves to such deception of the public.

The American Public Health Association has always stood against such practices. Within the past year members of the Association and some who have reached the dignity of Fellowship, and are even health

officers, have signed advertisements of various products. Feeling that this is a scandal affecting our honor, the following resolution amending the By-laws was passed by the Governing Council at the Annual Meeting in Fort Worth, October 30, 1930:

If, in the opinion of the Executive Board, any member or Fellow of the Association be found (hereafter) to have permitted the use of his name, or otherwise to have allowed himself to be quoted or used for illustration in the advertising of a commercial product, in such a manner as to reflect discredit upon the Association, his Fellowship or membership in the Association shall thereupon be terminated. The application of this article shall not be retroactive.

The enforcement of the provisions of this resolution lies with the Committee on Fellowship and Membership. The Executive Board of the Association has asked for the publication of the resolution. We therefore commend its careful study to those members and Fellows who have allowed themselves to engage in the practice condemned. We earnestly beg that those who have the honor of being members or Fellows of this Association refuse the use of their names in advertisements of any and every sort. One of the great functions of this Association is to instruct the public in matters of health. When a member sells his name for the exploitation of all sorts of products, he strikes a blow at the dignity of the profession to which he owes allegiance, and breaks down the confidence of the public in it.

THE LEONARD WOOD MEMORIAL CONFERENCE ON LEPROSY

THERE was held in Manila, January 9-23, 1931, an International Conference on Leprosy under the auspices of the Leonard Wood Memorial. Stress was laid on the importance of an international understanding among those studying the disease, since great confusion has existed concerning situations and practices. It was advised that leprosy workers be afforded opportunities of making study tours and be transferred from one region to another in order to study the peculiarities and conditions in other countries. Since the term "leper" carries social stigma, it was advised that the word be dropped, and the phrase "case of leprosy" be used.

The clinical classification recommended was: (a) neural, and (b) cutaneous, though it was recognized that it was a general disease seldom or never confined to one tissue. "Open" and "closed" cases were recognized chiefly with regard to administrative action. The lesions were classified and terms suggested for them, with the hope that standardization among writers and workers would result. Those

ulcers, due directly to the disease, which discharge leprosy bacilli are called "leprotic," while those caused indirectly are "trophic," as they are usually the result of destruction of the nerve. Special stress was laid on the importance of early diagnosis, since treatment is more successful than in later stages. The use of some form of the chaulmoogra group of oils or their derivatives was stressed.

An important point discussed was the decision of whether cases were active, quiescent, or arrested. The last term was suggested as being more conservative. In general, the terminology concerning leprosy was brought more into line with that of tuberculosis. Many suggestions were made concerning research and the particular lines which it should follow.

Perhaps the most important action was the formation of an International Leprosy Association, with Dr. Victor G. Heiser, President. It was decided also to publish a *Journal of Leprosy*, with Dr. H. W. Wade of the Culion Leper Colony as temporary Editor, assisted by Dr. Lie of Norway, and Dr. Maxwell of China.

A VALUABLE IDEA FROM JOHNS HOPKINS

THE recent action of the faculty of the School of Hygiene and Public Health of Johns Hopkins University is extremely significant to the teaching profession. The School of Public Health was founded through the efforts of Dr. William H. Welch and he was its first Director. He was succeeded by Dr. William H. Howell, a physiologist of world-wide reputation. His retirement in 1931 led to the necessity for some change and the selection of a new head for the school. The faculty showed its wisdom in selecting Dr. Wade H. Frost as its Dean, the office of Director having been abolished.

It seems that the faculty as a whole believed that the control of the school belonged properly to themselves. This is very different from the general practice in the schools of universities throughout the United States, since the faculty as a whole is not consulted, and the office of Dean goes only too often to some gumshoe politician or incompetent who has spent more time in toadying to the powers that be than in scientific work.

Really scientific men bent on research usually dislike administrative work, though some of them are forced into it by their prominence. This has been admirably expressed somewhat as follows: "When a man does notable scientific work, he is sterilized by being put in an executive position." The system in vogue in most institutions is not consistent with our ideas of democracy. Presidents occasionally want deans who have some ideas, but for the most part, they apparently

prefer men who will "go along," and support them in times of controversy.

At the Johns Hopkins School, a limit of three years has been fixed with the provision that the Dean cannot succeed himself. This has some excellent features, and some which are not so good, though it prevents the building up of cliques. A somewhat similar rule is in vogue in many scientific societies. In a school it means that the dean can return to his specialty within a few years and his election does not "sterilize" him for life. When a particularly good dean has been chosen, as is doubtless true in the case which has led to this discussion, there will naturally be regret when his term of service is over, though we cannot but approve of the fundamental idea and the spirit which has led to this change. We commend the action and its educational sanity to other institutions.

ASSOCIATION NEWS

SIXTIETH ANNUAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION
Montreal—September 14-17
HEADQUARTERS—WINDSOR HOTEL

IN reply to a recent communication, more than 600 members of the Association have already expressed their intention to attend the Montreal Annual Meeting. Less than one-quarter of the total membership has been heard from, and if the same proportion holds throughout, the attendance will approximate 2,000, not including guests.

The Annual Meeting Program Committee has held two meetings, one with Section Secretaries. Aime Cousineau, Secretary of the Local Committee on Arrangements, has reported local progress in the organization of groups to plan entertainment, scientific trips, transportation, etc. Section Secretaries

have received more offers of papers than in previous years, and in several instances, section programs are already complete. Special sessions on Rural Sanitation, Health Education and Toxoid Immunization are being arranged. There is considerable interest in the contemplated session on British Public Health Administration and invitations have been issued to a number of British authorities to present papers.

A number of luncheon and dinner sessions are planned, notably a dinner tendered in honor of Dr. Alice Hamilton, by the Industrial Hygiene Section, and a joint dinner meeting of the Health Officers Section, the International So-

ciety of Medical Officers of Health, and the American Association of School Physicians. The Public Health Engineering Section will hold its usual dinner meeting with the Conference of State Sanitary Engineers. The annual Banquet will be held at the close of the meeting on Thursday evening.

The preliminary program will be published in the August *Journal*.

POST-CONVENTION TOUR TO QUEBEC AND THE SAGUENAY RIVER

A FOUR-DAY Annual Meeting with its multiplicity of sessions, speakers, luncheon and dinner meetings, and close application to business of the day is sufficiently tiring to mind and body to justify a brief vacation at its close.

Because of the proximity of Quebec to Montreal and the beautiful scenery to be viewed on the St. Lawrence and on the Saguenay Rivers, the Executive

Board has approved a 3-day, all-expense trip by steamer after the Montreal meeting. The S. S. St. Lawrence has been chartered for the occasion and will leave Montreal about midnight on Thursday, September 17. The following day will be spent in Quebec at the invitation of Dr. V. Martin, the Medical Officer of Health. The world-renowned shrine of St. Anne de Beaupre will be visited and Montmorency Falls. Saturday morning the steamer stops at Grosse Isle for an hour or two so that the Government Quarantine Station, under the direction of Dr. Pagé, may be inspected. Then follows a trip up the lovely Saguenay River. The return to Montreal will be made in daylight and delegates will arrive in time to board evening trains for home.

A detailed itinerary is in the mails at this time. Reservations may be made at once.

ANNUAL MEETING INFORMATION

REDUCED RAILROAD FARES

REDUCED railroad fares on the Identification Certificate Plan have been authorized by the several Passenger Associations in the United States and Canada, which will entitle all members and dependent members of their families to a special rate of a fare and one-half for the round trip to Montreal.

Under this plan an Identification Certificate *must be presented* to the ticket agent when purchasing tickets. (One will be mailed to every member of the Association about August 15.) This is the ticket agent's authority to issue to delegates and dependent members of their families a round-trip ticket to Montreal at the reduced rate. The routing should be specified when making the purchase, for the routing covered by the round-trip ticket cannot be changed at Montreal. All return tickets must be validated, before leaving Mont-

real, at the regular railroad ticket office. It is suggested that all members consult their local ticket agents in regard to dates of sale and return limit of reduced-rate tickets, as these limits vary according to distance from Montreal.

The Passenger Associations have authorized a special rate of fare and three-fifths for delegates who are taking the post-convention tour to the Saguenay, or who wish to return to their starting point by a different route. They should purchase tickets with return limit 30 days from date of sale.

Rates from principal centers on both bases are given herewith. Because summer tourist rates are less from some points than either fare and one-half or fare and three-fifths, a table of such rates is also included.

Fare and one-half, fare and three-fifths or summer tourist fare should be specified when purchasing tickets.

RAILROAD RATES FROM VARIOUS CENTERS TO MONTREAL

	Regular Rate One Way	Special Rate Round Trip	Lower Berth One Way	Upper Berth One Way	Summer Tourist Round Trip †
		1½ basis			
		\$ 66.57	1½ basis *		
Atlanta, Ga.....	\$ 44.38	\$ 71.01	\$13.50	\$10.80	\$ 71.81
Baltimore, Md.....	20.71	33.14	7.50	6.00	33.80
Boston, Mass.....	11.80	18.88	3.75	3.00	21.45
Buffalo, N. Y.....	15.17	24.28	4.50	3.60	23.78
Chicago, Ill.....	29.21	46.74	9.00	7.20	43.82
Cincinnati, O.....	28.78	46.05	10.13	8.10	44.11
Cleveland, O.....	21.81	34.90	6.38	5.10	34.41
Dallas, Tex.....	61.19	97.91	19.50	15.60	96.72
Denver, Colo.....	66.49	106.39	19.88	15.90	103.47
Detroit, Mich.....	19.40	31.04	6.00	4.80	29.10
Duluth, Minn. (via Chicago)...	38.74	61.99	13.50	10.20	65.20
Fort Worth, Tex.....	61.19	97.91	19.50	15.60	96.72
Indianapolis, Ind.....	28.98	46.37	11.25	9.00	44.43
Jacksonville, Fla.....	50.56	80.90	14.63	11.70	81.60
Kansas City, Mo.....	45.75	73.20	13.50	10.80	70.32
Los Angeles, Calif.....	109.05	174.48	32.63	26.10	148.72
Louisville, Ky.....	33.09	52.95	11.25	9.00	51.01
Memphis, Tenn.....	45.50	72.80	15.75	12.60	72.05
Minneapolis, Minn.....	39.57	63.32	12.75	10.20	65.20
Nashville, Tenn.....	39.64	63.43	13.13	10.50	61.76
New Orleans, La.....	56.67	90.68	18.00	14.40	92.56
New York, N. Y.....	14.01	22.42	3.75	3.00	22.42
Omaha, Neb.....	47.14	75.43	13.50	10.80	72.52
Philadelphia, Pa.	17.25	27.60	3.75	3.00	28.26
Pittsburgh, Pa.....	24.37	39.00	4.50	3.60	38.50
Portland, Ore.....	100.94	161.51	32.63	26.10	134.10
Salt Lake City, Utah.....	84.28	134.85	24.38	19.50	118.37
San Francisco, Calif.....	109.05	174.48	32.63	26.10	148.72
Seattle, Wash.....	100.94	161.51	32.63	26.10	134.10
St. Louis, Mo.....	37.16	59.46	10.50	8.40	57.52
Washington, D. C.....	22.15	35.44	7.50	6.00	36.10
Brandon, Man., Canada.....	52.60	84.16	13.75	11.00	84.15
Calgary, Alb., Canada.....	75.50	120.80	20.00	16.00	120.80
Charlottetown, Pr. E. I., Canada.	20.70	33.12	5.60	4.50	37.25
Fredericton, N. B., Canada.....	16.35	26.16	4.35	3.50	29.45
Hamilton, Ont., Canada.....	12.85	20.56	3.45	2.75	22.50
Harbor Grace, Newfoundland...	51.75	82.80	12.50	10.00	
Halifax, N. S., Canada.....	21.35	34.16	5.95	4.75	38.45
Juneau, Alaska.....	120.19	192.31	25.60	20.50	172.60
Kenora, Ont., Canada.....	44.40	71.04	11.55	9.25	77.90
Kentville, N. S., Canada.....	22.40	35.84	4.35	3.50	
Ottawa, Ont., Canada.....	3.85	6.16	2.50	2.00	
Port Arthur, Ont., Canada.....	34.10	54.56	9.05	7.25	61.40
Quebec, Que., Canada.....	5.65	9.04	2.50	2.00	10.15
Saskatoon, Sask., Canada.....	64.25	102.80	16.85	13.50	102.80
St. John, N. B., Canada.....	17.20	27.52	4.35	3.50	30.95
Toronto, Ont., Canada.....	11.50	18.40	3.10	2.50	22.50
Three Rivers, Que., Canada.....	2.90	4.64			
Vancouver, B. C., Canada.....	100.94	161.51	25.60	20.50	134.10
Winnipeg, Man., Canada.....	48.00	76.80	12.80	10.25	76.80

* Return trip may be made over different route.

† Summer Tourist Tickets will be sold from May 15 to and including September 30. Passengers using these tickets must return to starting point by October 31.

MAKE YOUR HOTEL RESERVATIONS NOW

MONTREAL is popular as a convention city. There is every indication even at this early date of a record attendance when the American Public Health Association and other affiliated societies meet there September 14-17.

The Windsor and the Mount Royal are the leading hotels. The Windsor is the headquarters hotel because of superior meeting hall facilities. Only a few hundred delegates can be accommodated at the Windsor. Single rooms

there are decidedly limited. If you plan to attend the Montreal sessions, and wish to stay at the headquarters hotel, it is suggested that you make arrangements with an associate to occupy a double room.

The Mount Royal is a short block from the Windsor and can supply either single or double room accommodations.

Room rates for both hotels are given below, together with rates for other good Montreal hotels.

Make your reservation now!

MONTREAL HOTEL RATES

Hotel	Room Capacity	Single Room		Double Room	
		Without Bath	With Bath	Without Bath	With Bath
de la Salle.....	150	....	\$3.00-\$5.00	....	\$4.00-\$6.00
Ford.....	750	\$1.50-\$2.25	\$2.50	\$3.00-\$4.50	\$5.00-\$6.00
Mount Royal.....	1,100	....	\$4.00	....	\$7.00
Place Viger.....	125	\$3.00	\$4.00	\$5.00	\$7.00
Queen's.....	500	\$3.00-\$3.50	\$4.00-\$5.00	\$6.00	\$7.00-\$10.00
Ritz-Carlton.....	250	....	\$6.00	....	\$10.00-\$12.00
Windsor.....	750	....	\$4.50-\$6.00	....	\$8.00-\$12.00

.....(Cut off on this line).....

HOTEL RESERVATION BLANK FOR MONTREAL MEETING
AMERICAN PUBLIC HEALTH ASSOCIATION

SEPTEMBER 14-17, 1931.

To.....
(Name of Hotel)

Please reserve for me.....rooms for.....persons
for the A. P. H. A. Meeting. (Cross [X] is placed after my preference.)

Single room.....Double room.....

Maximum rate per day for room \$.....Minimum rate per day for room \$.....

I expect to arrive..... If date of arrival is changed I will notify
you at least 24 hours in advance.

Please acknowledge this reservation.

Name.....

Street Address.....

City..... State.....

NEW MEMBERS

The following list includes applicants who have been approved for membership in the A. P. H. A. by the Sub-committee on Eligibility. These new members have requested affiliation with the sections indicated, and action by the Section Council will follow.

Health Officers Section

- Laura Arney, Elmwood Park, Ill., Commissioner of Health
 G. N. Bilby, M.D., Oklahoma City, Okla., State Health Commissioner
 C. M. Burchfiel, A.B., B.S., M.D., San Jose, Calif., Health Officer, Santa Clara County
 Jean P. Decarie, M.D., Montreal, P. Que., Inspector General, Provincial Bureau of Health
 Avery A. Drake, M.D., B.A., Flat River, Mo., Assistant Health Officer
 Milford G. Flath, Stanley, N. D., City Health Officer
 Will H. Moore, M.D., Valley City, N. D., City Health Officer
 Wilbur N. O'Brien, Ph.G., Ph.C., Newburyport, Mass., Agent, Board of Health
 Harry B. Torrey, Ph.D., M.D., Palo Alto, Calif., Professor of Hygiene and Physical Education

Laboratory Section

- J. A. Trent, M.A., Pittsburg, Kans., Assistant Professor, Biological Sciences

Public Health Engineering Section

- Rene Cyr, C.E., Montreal, P. Que., Assistant Sanitary Engineer, Provincial Bureau of Health
 Marc Gilbert, B.A., C.E., B.S.A., Montreal, P. Que., Secretary of Sanitary Engineer, Dept. of Health
 Adrien Plamondon, B.A., C.E., Montreal, P. Que., Consulting Engineer for Local Municipalities
 Leo B. Wood, Flat River, Mo., Sanitary Engineer, Dept. of Health

Industrial Hygiene Section

- Murl E. Fulk, B.S., A.B., A.M., M.D., Philo, O., Industrial Physician, Ohio Power Co.

Food, Drugs & Nutrition Section

- Lawrence W. Bass, Ph.D., New York, N. Y., Assistant Director of Research, Borden Co.
 Ray W. Clough, Ph.D., Seattle, Wash., Chemist and Bacteriologist, National Canners Assn.
 Ruben W. Hills, San Francisco, Calif. (Assoc.)

Child Hygiene Section

- Joseph B. Bloom, M.D., B.S., Pittsburgh, Pa., School Physician
 Myrnie A. Gifford, M.D., Berkeley, Calif., Field Physician, Bureau of Child Hygiene, State Dept. of Health
 Clare Terwilliger, A.B., R.N., New York, N. Y., Assistant Secretary, Murry & Leonie Guggenheim Dental Clinic

Public Health Education Section

- Clifford S. Thompson, M.D.C.M., Montreal, P. Que., Medical Officer, Steel Co. of Canada

Public Health Nursing Section

- Catharine S. Bastin, R.N., A.B., Portland, Ore., Assistant Professor of Applied Social Science and Nursing Education
 Clara B. Gould, P.H.N., San Jose, Calif., Supervising Nurse, Santa Clara County Health Dept.
 Edna M. Hardsaw, P.H.N., Charleston, W. Va., Supervisor of Public Health Nursing, State Dept. of Health
 Emma S. Maylor, Albuquerque, New Mex., Public Health Nurse, Bernalillo County Health Dept.
 Eunice T. Munson, R.N., Philippi, W. Va., School Nurse
 Sarah I. Richards, R.N., Jensen, Fla., Staff Nurse, State Board of Health
 Kathryn Schulken, R.N., Denver, Colo., Supt. Visiting Nurse Assn.
 Hortense P. Stafford, R.N., Carbondale, Ill., U. S. District Nurse (Assoc.)
 Helen M. Wolfe, Twin Falls, Idaho, Public Health Nurse, Health Unit

Epidemiology Section

- R. R. Parker, Ph.D., Hamilton, Mont., Special Expert, U. S. Public Health Service, Charge Rocky Mountain Spotted Fever Investigation

Unaffiliated

- Edward J. McKay, Woodside, L. I. (Assoc.)

DECEASED MEMBERS

- SAMUEL H. DURGIN, M.D., Allston, Mass., Elected Member 1875, Honorary Fellow 1922
 ALLEN HAZEN, New York, N. Y., Elected Member 1892, Fellow 1922
 THOMAS F. KENNEY, M.D., Worcester, Mass., Elected Member 1918, Fellow 1922
 V. A. MOORE, M.D., Ithaca, N. Y., Elected Member 1896, Fellow 1922
 R. A. MARTIN, M.D., Petersburg, Va., Elected Member 1919, Fellow 1923
 MARY ELIZABETH AYER, R.N., Northampton, Mass., Elected Member 1928
 WILLIAM H. BEATTY, New York, N. Y., Elected Member 1930 (Assoc.)
 H. T. G. NAUMANN, Port Huron, Mich., Elected Member 1917

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

EPIDEMIOLOGICAL MASTER CHART

GEORGE B. DARLING, JR.

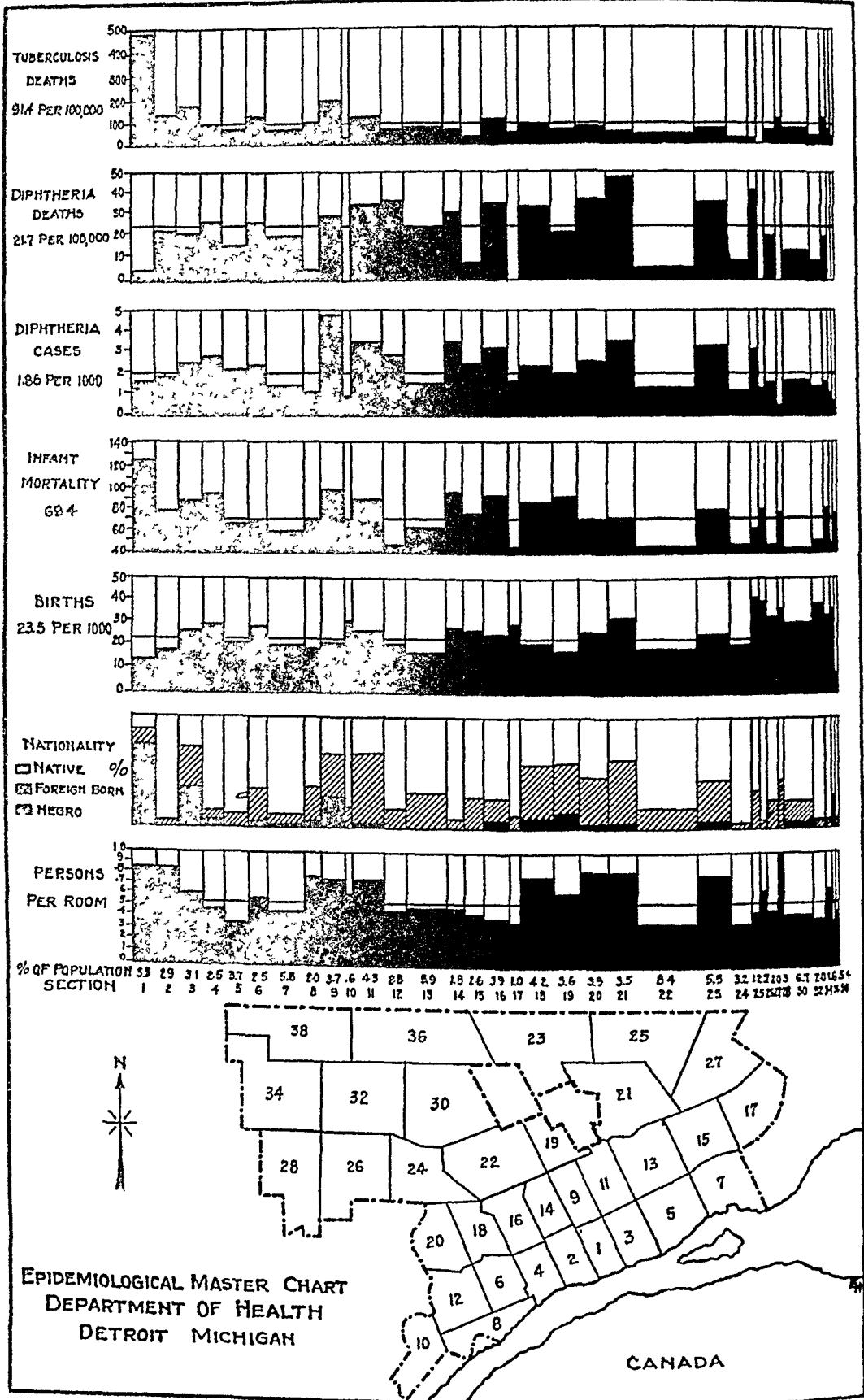
Assistant Epidemiologist, Department of Health, Detroit, Mich.

A NEED has long been felt for a simple graphical presentation of certain epidemiological data often correlated in analyses of public health problems. The need has been particularly acute in the supervision of large areas such as states or in the larger municipalities. For the statement of the problem, rates for the city or state have been sufficient; but for administrators faced with the necessity of attacking these problems at some definite point, it is essential that they be factored into their component parts. This is usually accomplished by division into districts. The common method has been to use maps and show by means of colors or different cross hatching the various degrees of the condition under analysis. The difficulties inherent in this type are familiar to all those who have used them. The necessity for many maps and the fallibility of visual perception lead to varying degrees of interpretation of the actual situation. Then, too, arbitrary groups must be assumed with limits defining the use of a particular color or cross hatching. Variations or trends within these artificial groups are lost entirely.

The master chart presented herewith has been very helpful in Detroit in analyzing the various problems indicated. It has been found particularly useful in two main fields—first, the intelligent planning of campaigns for the lowering of specific death rates; and

second, in explaining to the mayor and common council, and other interested lay groups, the reasons for certain activities and the necessity for continued financial support. For example, in the recent campaign for the eradication of diphtheria the chart clearly indicated those districts in which intensive house-to-house canvassing by nurses would be most helpful.

The principle of the chart is simple enough. The city (or state) is divided into sanitary districts. The necessary information is compiled by district. The map shows the geographical relationship of district to district. The bar is divided into as many parts as there are districts. The districts are laid off in numerical sequence, the width allotted on the base line being that per cent of the length of the bar that the population of that district is of the total population of the city. The horizontal line then represents the average rate for the city, and the rate for the district is indicated by the height of the bar. The scales used are those most convenient for the graphical presentation. The rates from district to district are easily compared by the height of the bars. At the same time the area of the bar shows in direct proportion the number of people affected by that rate. Thus it may be seen at a glance that a high rate in a certain district may affect a very much smaller number of people than a low rate in another district which may



as a consequence be of much greater significance in its effect on the rate of the city as a whole.

A word should be said about the bar on nationality. In the chart as it is used in Detroit the foreign born groups are divided into their major nationalities and indicated by various colors. The prohibitive cost of reproduction of the chart in that form for publication makes the demonstration of the value of this method impossible. It has been found extremely helpful however. For instance it will be seen from the chart that the districts with the highest diphtheria rates have the highest percentages of foreign born. It was found upon analysis that Polish was the highest single contributing nationality and was represented in its correct proportion by a yellow horizontal band. The advantage of this information to an administrator about to throw a large number of nurses in the field is obvious.

Correlation of the high tuberculosis death rates with high percentages of

colored population is easily seen as is the reverse relationship in regard to diphtheria rates.

The bar on density of population shows the worst crowding in a district with a relatively small number of people. If this is compared with the various morbidity and mortality rates for the district and also with the actual area as shown by the map the value of the chart is well illustrated.

Of course, in this reproduction the number of items has been limited but all of the information necessary to the adequate understanding of a city by its health officer may be so charted. The method has also been found very valuable in comparing the trend of a particular condition over a period of years. For this purpose the bars are used for intervals of time rather than for various items.

The epidemiological master chart is offered as a new tool in the statistical approach to the complex administrative problems of public health.

LABORATORY

JOHN F. NORTON, PH. D.

USE OF OCULISTS' LOUPE IN THE ISOLATION OF PURE BACTERIAL CULTURES

IVAN C. HALL, PH. D.

*Department of Bacteriology and Public Health, University of Colorado,
School of Medicine and Hospitals, Denver, Colo.*

THE successful isolation of pure cultures by the methods of Koch and Hesse depends, as is well known, upon securing a sufficient separation of the cells in or upon the medium to permit each to develop a new colony apart from other colonies. If two or more daughter cells cling together and form a single

colony, as in the case of the diplococci or the streptococci, it makes no difference whatever; all of the cells of the new colony have been derived from a single parent cell, and succeeding cultures transferred from such a colony will be pure, precisely as if a single cell had been transferred by a Barber pipette.

The principal error involved in cultural methods of isolation depends upon the possibility that occasionally two or more cells of different parentage may adhere and their progeny be represented together in the colony. If the associated species should happen to be of similar morphology or if one should greatly outgrow the other, the chance of detecting the impurity microscopically would be very slight. In isolating aerobic bacteria from agar plates one occasionally transfers obligate anaerobes whose presence is not at first detected, and in isolating anaerobic bacteria from deep agar one sometimes carries along a second species whose specialized requirements for growth were not met in the medium used, thus resulting in impure cultures. These contingencies fortunately are not very common; the first may be overcome easily by repeated aerobic transfers, the second, by the use of different kinds of mediums for successive isolations.

A much more common source of impurity in fished cultures is the adjacent growth of minute colonies that can be detected only by a meticulously critical microscopic examination. Surprisingly few of the recent textbooks emphasize this point although it is well covered and in essentially similar fashion by Zinsser's *Textbook of Bacteriology* (1929) and by Park and Williams' *Pathogenic Micro-organisms* (1929).

Quoting Zinsser, p. 143:

Cultures should never be fished under the naked eye, no matter how far apart and discrete they may appear, since not infrequently close to the edge of or just beneath a larger colony there may be a minute colony of another species which may be too small to be visible to the naked eye, but which, nevertheless, if touched by accident will contaminate the subculture.

For proper "fishing," the Petri plate with cover removed should be placed upon the stage of the microscope and examined with a low power objective, such as Leitz No. 2 or Zeiss AA. The sterilized platinum needle,

held in the right hand, is then carefully directed into the line of focus of the lens, while the small finger of the hand is steadied upon the edge of the microscope stage. When the



FIGURE I—Fishing aerobic colonies with the Hardy-Beebe Binocular Loupe

point of the needle is clearly visible through the microscope, it is gently depressed until it is seen to touch the colony and to carry away a portion of it. The needle is then withdrawn without again touching the nutrient medium or the edges of the glass or lens, and transferred to a tube of whatever medium is desired. In this way, individuals of one colony—descendants of a single bacterium of the original mixture—are carried over to the fresh medium.

This procedure is open to the objections that it unduly exposes the colonies to contamination from the air, and that it is difficult to guide the needle while looking through the compound microscope.

Dissecting microscopes, reading glasses, and engraver's monacles have been tried with indifferent success. For the last decade I have used a small Coddington lens (10x) for examining

and selecting colonies which were then picked with the naked eye, holding the dish slightly open for a moment in the left hand while manipulating the needle in the right. I believe this method is used widely, in spite of Zinsser's admonition to the contrary.

During the past year I have used the binocular Hardy-Beebe loupe¹ sold by the American Optical Company, with greatest satisfaction in picking colonies after they have been first inspected and selected by means of the hand lens. If such a loupe has ever been advocated for bacteriological work, I have been unable to find any reference to it in a careful search of the literature.

Its advantages are obvious. The milled adjustment of the width between the anterior lenses facilitates exact duplication of the binocular images. If one wears glasses he may have his own lenses inserted in the frames or the loupe may be worn over his own spectacles. The great advantage of switching instantly from the loupe to ordinary vision and back again, with the hands entirely free to manipulate plate or tube cultures and planting wires, must be experienced to be appreciated. The use

of the loupe is illustrated herewith (Figure I).

In isolating aerobic bacteria, it is our practice to streak from liquid cultures or suspensions upon half the surface of prepared plain, blood, or eosin-methylene blue plates, leaving the other half untouched as a control upon the sterility of the medium. Confluent colonies generally appear upon that portion first streaked while well separated colonies usually appear near the center of the plate. These are fished under the loupe to the unused surface and after incubation examined microscopically for purity. This plan effects a great saving of culture media and time as compared with the commonly used method of plating out serial dilutions in agar.

The loupe is used similarly in the isolation of anaerobic bacteria grown as separate colonies in Burri tubes, from which the agar cylinders have been pushed out into sterile Petri dishes and sliced as described in a previous paper.²

REFERENCES

1. *Am. Encyclopedia of Ophthalmology*, 6: 4610, 1915.
2. Hall, I. C. An Improved Technic in Burri's Method of Isolating Obligately Anaerobic Bacteria, *A. J. P. H.*, 20: 536 (May), 1930.

A RAPID METHOD OF TYPING PNEUMOCOCCI

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THE first requisite in the serum treatment of pneumonia is the determination of the type of the invading pneumococcus. The value of early administration of serum is one of the dominant factors being stressed today; hence it is all the more imperative that the particular type of pneumococcus should be determined at the earliest moment.

Neufeld demonstrated as early as 1902 that on mixing pneumococci and

serum from animals previously inoculated with the homologous strain and examining microscopically, agglutination was seen to occur. Recently Sabin has made certain modifications of this procedure, so that a rapid and very reliable method is available.

The procedure is much as follows:

1. A representative sample of sputum should be obtained, if necessary, waiting until the patient expectorates material directly from the bronchial tract in-

stead of saliva or pharyngeal secretions. A surprisingly small amount of actual sputum is necessary. The sample should be obtained in a clean sterile container, free from any preservative.

2. Wash the sputum at least three times by swirling the mass of sputum around in sterile saline contained in three separate Petri dishes. This tends to remove extraneous microorganisms. Following this, the sputum is thoroughly emulsified in saline, and in order to facilitate this, a 5 c.c. syringe and a needle of large caliber are very useful. At least 1 c.c. of emulsified sputum is then injected intraperitoneally into a mouse, using a needle of small caliber. As a matter of routine, two mice are injected.

3. In 3 hours a peritoneal puncture is performed, using a capillary pipette made by drawing out a piece of small glass tubing in a flame. The finer the pipette, the more satisfactory it is for this purpose. Grasp the mouse by the loose skin of the neck between the thumb and index finger, with the back of the mouse across the palmar surface of the hand, and made secure by looping the tail between the ring and little fingers. The abdomen of the mouse being thus well exposed, the capillary pipette is passed into the peritoneal cavity, and by capillary traction fluid will be seen extending into the pipette. The pipette is then removed and the mouse is kept for further observation.

4. The surface of a well cleaned glass slide is divided into four sections, using a glass pencil. On each of these four sections is placed a small drop of the peritoneal exudate from the pipette. With the first of the four drops of peritoneal exudate is mixed a drop of saline which is then spread thinly and allowed to dry. To the second drop of the exudate, a drop of Type I agglutinating serum diluted 1 in 10 is added and the mixture is spread thinly and allowed to dry. Similarly, the third

drop of exudate is mixed with a drop of Type II agglutinating serum, diluted 1 in 10, and is spread thinly and allowed to dry, and to the last drop of exudate a drop of Type III agglutinating serum, diluted 1 in 5, is added and the mixture is spread thinly and allowed to dry. The films are then fixed by passing the slide two or three times over a moderate flame. (For convenience one usually labels each of the above four sections as Sal., I, II, III with red pencil.)

5. The slide is then stained for 1 minute with basic fuchsin stain. The stain, which should be fresh, is made by adding 10 c.c. of a saturated alcoholic solution of basic fuchsin to 90 c.c. of distilled water, and filtering through paper. (The saturated alcoholic solution is made by adding 10 g. of basic fuchsin to 100 c.c. of absolute alcohol.) Other stains such as methyl violet may be used, but basic fuchsin has been found to be the most satisfactory. Wash off the stain gently with water, blot dry and examine under an oil immersion lens. The saline suspension is examined first and serves as a control. The character of the microorganisms is then determined. Frequently a pure culture of a lance-shaped diplococcus is found. The other sections are examined in sequence, and definite clumping of lance-shaped diplococci in one of the sections serves to denote the type. There may be many clumps consisting of only a few organisms or a few large clumps covering several microscopic fields. In examining for clumps one should not be misled by microorganisms, such as Gram-negative cocci, which tend to occur in clumps, or the grape-like clumps of staphylococci. These may be distinguished by being round or coccoid in shape in contrast to the lance-shaped diplococcus of pneumonia. The so-called capsule may be quite marked, especially in animal exudates such as obtained from the peritoneum of the mouse. Type III pneumococci usually

show very marked capsules, often so much so that the organisms themselves are seen with difficulty and the clumps are not usually packed so tightly together as are Type I or Type II organisms. Further, in a clump of Type III pneumococci one may see a very fine thread-like matrix extending from organism to organism.

Usually the sputum is well digested in the peritoneal cavity of the mouse within 3 hours, especially in Type III cases, but occasionally one may be required to repeat the peritoneal puncture after a lapse of 4 or even 6 hours in order to obtain a satisfactory result. In our experience a sputum in which a satisfactory typing was not obtained after 6 hours was either free of a fixed type of pneumococcus or contained some other organism such as a streptococcus.

6. The mouse almost invariably survives the peritoneal puncture, but, if the organism is virulent, the mouse dies in from 18 to 24 hours. The peritoneum is then opened under aseptic precautions and the contents are washed out with 3 to 4 c.c. of saline. The washings are centrifuged, first at very low speed in order to throw down any blood cells. The supernatant fluid is drawn off and centrifuged at high speed to throw down the microorganisms.

A "ring test" or precipitin test is performed by floating about 0.1 c.c. of the supernatant over an equal quantity of agglutinating serum, diluted 1 in 10.

At the point of contact of serum and fluid a fluffy white ring appears almost immediately in the tube containing the serum of the corresponding type. The standard macroscopic agglutination test may be made with the centrifuged sediment. The latter two tests serve as a check on the rapid method, but in our experience the "ring test" is more readily and accurately interpreted. A broth culture may be made from the heart's blood of the mouse for purposes of further examination, and usually a pure culture of the pneumococcus is obtained from this source.

In a very early case of pneumonia, the first strain isolated may not be one of the fixed types so that it is often advisable to obtain another sample of sputum and repeat the search. In this way a Type I, II or III, which otherwise would have been missed, may be obtained.

We have found the rapid method of typing very satisfactory in the examination of spinal fluid, pleural exudate or blood cultures. Usually by proceeding directly with the material at hand instead of injecting a mouse, the type may be determined. If there are not sufficient organisms present, centrifuge the material and resuspend in a small amount of the supernatant. Failing either of these methods, one should inject the material into the peritoneal cavity of a mouse and proceed as with sputum.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Vital Statistics for Scotland—1930—According to provisional figures reported by the Registrar-General for Scotland, the birth rate in 1930 was 19.3 per 1,000, which is 0.3 more than that of the previous year, but 0.9 less than that of the preceding 5 years, and 2.9 less than that of the preceding 10 years. The marriage rate was 6.8 per 1,000, which is the same as that for the previous year, and 0.2 more than the average of the preceding 5 years. The death rate was 13.2, which is 1.3 below the rate for 1929, 0.3 lower than the average of the preceding 5 years, and 0.6 lower than that for the preceding 10 years. The infant mortality rate for 1930 was 83 per 1,000 births, which is 4 less than that of 1929 and 7 less than the average of the preceding 10 years.

The death rate from all forms of tuberculosis, the lowest rate yet recorded for tuberculosis in Scotland, was 88 per 100,000 in 1930. It is 6 less than that for 1929 and 22 below the average of the past 10 years. The death rate from respiratory tuberculosis also reached a new low level in 1930, being 62 per 100,000, which is 5 less than in 1929 and 14 below the average of the past 10 years. Deaths from cancer numbered 7,120, which number shows an increase of 271 above the average for the preceding 5 years, and 622 above that for the previous 10 years.—*Med. Off.*, 45: 120 (Mar. 14), 1931.

Increase in Lung Cancer in Hamburg, Germany—Reports from the St. George Hospital in Hamburg indicate that since 1924 there has been in that region a notable increase in the fre-

quency of primary cancer of the lung. From 1911 to 1923, primary cancer of the lung constituted 0.36 per cent of all necropsies; during the 7-year period 1924 to 1930 the proportion rose to 1.06 per cent of all necropsies. The 50 to 60 and the 60 to 70 age groups were especially affected. The incidence among males is about three times as great as that among females. Among the causes of the increased incidence is the present higher average age of the population. More persons than formerly enter the cancer age. In addition to constitution, hereditary predisposition and trauma, chronic inflammatory irritants of all kinds may be incriminated, among which, besides influenza, may be mentioned especially the inspiration of dust and the exhaust gases of automobiles, more particularly of the heavy-oil motors.—*J. A. M. A.*, 96: 1328 (Apr. 18), 1931.

Public Health Progress in the Philippines during 1929—There seems to be some difficulty in the Philippine Islands in obtaining reliable health statistics, as the figures given in this article are all followed by the words "estimated" or "incomplete." The death rate for 1929 was 22.18, which is higher by 1.17 than the average rate for the past 5 years. The infant mortality rate was 165.03, against 154.02, the average for the past 5 years. The increase in the mortality was mostly from respiratory diseases, which were 5,118 in excess of the previous year: beriberi, diarrhea and enteritis, tuberculosis and dysentery also showed increases. There was a reduction in typhoid fever and

the mortality was the lowest recorded for this disease. Only 1 case of cholera occurred and it may therefore be said that the Philippine Islands have been free from outbreaks of cholera since 1926. Continuous anti-cholera vaccination of the masses is perhaps the factor most responsible for this satisfactory state of things. Only a few cases of smallpox occurred.

Vaccination is carried out very systematically and extensively, except in the non-Christian regions where great opposition by the natives is met with. Cerebrospinal meningitis never attained an epidemic character during the year: there were only 12 cases with 6 deaths from the disease in the City of Manila and 16 cases with 13 deaths in the provinces. As a number of Filipinos developed this disease on board ship on their way to Hawaii or the west coast of the United States special search was made for carriers among the general population and Filipinos going abroad. Only 0.9 per cent of over 10,000 examined were found positive. Tuberculosis caused over 30,000 deaths, equal to 12 per cent of the deaths. The mortality from malaria has been reduced to about a half of what it was in 1926. There were, at the end of 1929, 6,494 lepers under segregation and 1,321 new cases were isolated during the year. Patients are now presenting themselves for treatment in the early stages. Since 1922, 2,013 leprosy patients have been rendered negative and released. Prophylactic inoculations against smallpox, typhoid and paratyphoid, dysentery and cholera were performed as routine measures for the prevention of these diseases.—E. D. Aguilar, *J. Philippine Is. M. Dis.*, 10: 190–202, 1930. Abstr. by A. J. Collis, *Bull. Hyg.*, 6: 147–148 (Feb.), 1931.

Vital Statistics of Rio de Janeiro
—During the year 1929, there were 8,830 marriages and 39,042 births (of

which 36,188 were live births and 2,854 stillbirths) in the Federal District of Brazil. In the same year, 25,955 deaths occurred (that is, a coefficient of 15 per 1,000 of population). The still-born rate, which was diminishing from 1920 to 1923, began to rise again from 1923 to 1929. The outgoing and incoming of persons to Rio de Janeiro gave a deficit of 26,109 inhabitants, which may be attributed to the presence of yellow fever at Rio de Janeiro. The population of the city was estimated in 1927 as 1,729,299 inhabitants, which number seems to be quite correct unless the next census proves the opposite. The Yellow Fever Commission listed 198,000 houses. Knowing the shortage of houses and that all of them are usually overcrowded, it may be considered as an average of 10 persons per house, which gives a total population of 1,980,000.—*J. A. M. A.*, 96: 1164 (Apr. 4), 1931.

Vital Statistics for Indiana in 1930—A preliminary report of the Vital Statistics Division of the State Board of Health in Indiana for the calendar year 1930 shows a decrease in deaths and in death rates from practically all communicable diseases. While the figures are subject to slight change, they are essentially accurate. The total number of births for 1930 was 58,971—a rate of 18.2, which represents a decrease of 0.2 below that of 1929 and 0.9 below that of 1928. The total deaths were 39,061—a rate of 12.1, which represents a decrease of 0.7 below that of 1929 and 1928.

The death rate for infants under 1 year of age was 57.7 for 1930, the lowest yet recorded for the state, and it shows a decrease of 5.9 below that of 1929 and 4.7 below that of 1928. Deaths of mothers from maternal causes show a rate of 5.5 as against 6.8 in 1929 and 6.0 in 1928. The death rates 65.9 for tuberculosis, 3.3 for typhoid

fever, 4.1 for diphtheria, 2.1 for scarlet fever, 1.8 for measles, 3.0 for whooping cough and 2.9 for puerperal septicemia are the lowest rates ever recorded in Indiana for these diseases.—*Month. Bull., Indiana State Board of Health*, 34: 201 (Jan.), 1931.

Fewer Women than Men in Japan—According to the general census taken October 1, 1930, and published by the government, December 8, the population of Japan proper is 64,447,724, comprising 32,388,369 males and 32,059,355 females, which is nearly double the population in 1872, 59 years ago. According to the Committee for the Investigation of Population and Food Problems, it is estimated that the population of Japan proper will grow to almost 90,340,000 in the next 30 years.

As to the population, it is strange to find that the number of males exceeds by 329,014 the number of females, 101 males to 100 females. Tokyo has the highest ratio of males to females, 111.9 to 100; next comes Hokkaido, 109.3; then Osaka, 108.9. In large cities and the mining and planting districts, the number of males is greater, while females are more numerous in places with many spinning factories. The smaller number of females is said to be due to the fact that many females die young. Dr. T. Nagai, specialist on problems of population, has published his opinion that Japanese mothers are apt to have another baby soon after they have lost their children.—*J. A. M. A.*, 96: 879 (Mar. 14), 1931.

Fatal Accidents in Old Age—The problem of fatal accidents is concentrated largely among children and old people. Two out of every 5 accidental deaths occur among those who are under 15 years or who have reached 65 years. Relatively few of these deaths are of occupational origin. They oc-

cur, almost entirely, in the home, on the streets or in other "public places"—among the old, mostly in the home.

Falls are by far the most important type of fatal accident among elderly persons. In fact, more old people lose their lives through falls than in all other forms of accident combined. The statistics for many years confirm this. They show, further, that falls cause about three times as many deaths every year as does the type of accident next in importance among old people, namely, automobile fatalities. Falls and automobile casualties combined cause every year more than two-thirds of all the fatal accidents among people who have passed age 65.

We may, therefore, discuss with profit the circumstances that underlie these two types of fatal accidents among old persons.

Fatal falls among the old occur, for the most part, in or about the home. About one-half of these fatalities are due to falling down stairs; and tripping over rugs or carpets, falling off or over chairs and falling in bathtubs are of no small importance. Such accidents, when they happen to younger persons, are not apt to terminate fatally; but in old age any sort of injury, including the shocks arising from fractures, dislocations, multiple contusions, or even lesser injuries, often hasten death, even if they are not primary causes.

What can be done to check the rising death rate from falls among elderly persons? It should be remembered that the elderly woman is a more frequent victim than the elderly man. Home safety, then, should be taught by women's organizations. This, in fact, is now being done by the General Federation of Women's Clubs in several states, notably, Illinois, Pennsylvania, and North Carolina.

The majority of the falls among both elderly men and women would never occur if a little more care and fore-

thought were exercised. Sane precautions are called for to see that homes are kept in such order as to minimize the danger of falls. Many fatal falls are traceable to poor illumination, loose, broken, or badly spaced treads, or to obstructions left on stairways. The combination of highly polished floors and small rugs is particularly dangerous.

One death out of every 7 in automobile accidents is that of an elderly person. This ratio bids fair to become higher. Automobile fatalities have become the foremost of all safety problems at all times of life, and much attention has been directed toward their control as they affect childhood. As a result we appear to have achieved a slight decrease in deaths among children. But (although little emphasis has ever been placed upon the fact) the actual death rate from automobile accidents is higher in old age than in childhood—and the increase is still going on.

There are other types of fatal accidents prominent in old age. More than one-fifth of the accidental asphyxiations by gas affect old people; one-eighth of the fatal burns; one-sixth of the accidents due to cutting and piercing instruments; one-fifth of those due to street-cars and horse-drawn vehicles; over one-fifth of the deaths due to injuries by animals; two-fifths of those caused by excessive cold; and one-quarter of those due to excessive heat.

On the other hand, it is relatively seldom that old people die of accidental poisoning by solid or liquid substances; very few are drowned, shoot themselves accidentally, or are killed by lightning. Among the deaths due to occupational hazards, such as mining, quarry or machinery accidents, elderly people seldom figure because few are exposed to these risks. Deaths in airplane and balloon accidents are almost nil.—*Stat. Bull., Met. Life Ins. Co., Mar., 1931.*

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

PROGRESS IN THE ENFORCEMENT OF THE NEW YORK STATE MILK CODE *

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IN New York the so-called "State Milk Code" constitutes Chapter III of the State Sanitary Code. It has the "effect of law" and is effective throughout the state excepting in New York City. It was first enacted in 1914 and was in general modeled after a code which had then been in effect in New York City for several years. The state code was generally revised in 1928 and the New York City Code a little later and, in the revision and following numerous conferences, the more essential requirements in the two were made practically uniform. In July, 1930, the state code was further amended, chiefly by the addition of more detailed and definite requirements relating to cream. The milk regulations are, therefore, uniform throughout the state, except for minor differences between the state and New York City Codes, and except as other cities, acting under authority given them by law, have enacted more stringent requirements, not inconsistent with those of the state code.

Substantial progress in milk control was made in the cities, and some, but decidedly less, in the villages and rural communities during the 14-year period

following the enactment of the original code. The enforcement of the code is the responsibility of the health officer of each city, town or village. Practically all of the health officers in villages and towns were part-time officials with little if any training in milk control work and, except in a few instances, without expert assistance. It is not surprising that there should be considerable variation in the degree of enforcement in different places. There are, however, many instances in which health officers of smaller communities have made a hobby of milk control which has resulted in giving some of these small municipalities as good or better milk supplies than some of the larger cities.

For a period of nearly 2 years previous to the general revision of the code and before it became effective in 1928, a committee appointed by the public health council and headed by Dr. Paul B. Brooks, Deputy Commissioner, made an exhaustive study of milk control, and called into consultation health officials, milk producers, and milk distributors to determine the necessity for and practicability of the various requirements to be included in the code. An effort was made to eliminate provisions of the original code which had no marked public health significance. Before the code went into effect, an inten-

* Read at a Joint Session of the Public Health Engineering and the Food, Drugs and Nutrition Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

sive educational campaign was carried on. Thousands of copies of the code were distributed and its provisions were discussed at numerous meetings attended by health officers, and milk producers and distributors.

An advisory committee made up of men representing the New York State Department of Agriculture and Markets, the State Agricultural College, the Geneva Experiment Station, large and small dealers and the producers, was appointed for the purposes of considering special problems that might arise as a result of the enforcement of the code and of promoting coöperation. This committee has been very helpful.

One of the important amendments of the milk code, made in 1928, provided for abandoning the old system of numerically scoring dairies in the grading of milk and basing grading chiefly upon bacterial examination of the milk. To make this provision effective, it became necessary to stimulate the development of laboratories in certain sections of the state. Through establishment of new laboratories or extension of the service of existing laboratories, laboratory facilities were made available to every health officer in the state. Taking advantage of a statute making this possible, the state has stimulated the development of county and municipal laboratories by paying half the cost of operating them when prescribed standards have been met.

Under another law, state aid is available to counties establishing county health departments and also to counties employing full-time county milk inspectors. This aid has contributed to improvement in milk control work, especially in the smaller communities in 7 counties. Four of these now have county health departments, 2 others have county milk inspectors, and another contracts with a commercial laboratory to do its milk laboratory and inspection work. Constant efforts are

being made to encourage the development of additional county units and the employment of county milk inspectors. Progress along this line is expected.

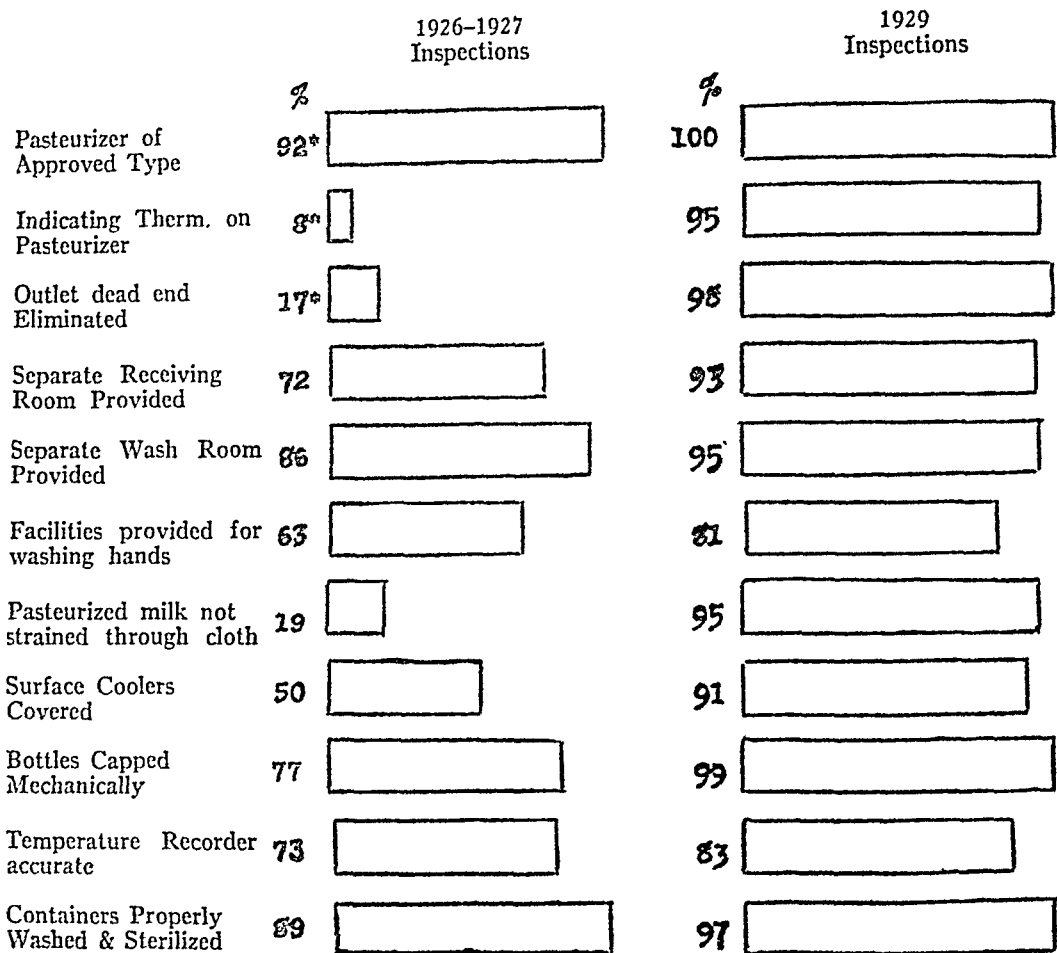
The code revisions effective in 1928 also included a general tightening up on the pasteurization requirements. The approval by the state commissioner of health of all pasteurizing apparatus as to type was required and also his approval in writing as to apparatus and efficiency of all plants producing pasteurized Grade A milk. Pasteurization was so defined as to require that *every particle* of milk be subjected to a temperature of 143° F. or more for not less than 30 minutes, whereas the original code required that milk be subjected to a temperature of 142 to 145° F. for not less than 30 minutes. A general revision was also made of pasteurizing plant regulations which are enacted by the commissioner as authorized by the code and are supplementary to the sanitary code.

Previous to 1928 the State Department of Health had had 2 men on milk control work attempting to cover an area of more than 47,000 square miles and the milk supply of more than 5 million people. Their efforts were necessarily limited. It was felt that the greatest good could be accomplished by devoting their time to inspecting pasteurizing plants and advising health officers as to their proper equipment, as to the efficiency of their operation and at the same time stimulating health officers to maintain standards and demand improvement.

Very soon after the revised code became effective, the milk control force was increased from 2 to 5 men. During the following year most pasteurizing plants were inspected twice instead of once and some that needed inspection most were visited three or four times during the year in order to secure the necessary improvements. In addition many tests of pasteurizers were made to

FIGURE I

STATUS OF NEW YORK STATE MILK PASTEURIZING PLANTS SHOWING PERCENTAGE COMPLIANCE WITH SANITARY REGULATIONS AT 280 PLANTS DURING 1926-1927 AND SAME PLANTS DURING 1929



* Not a legal requirement in 1926-27.

determine their efficiency. Continuous flow, in-the-bottle and pocket type pasteurizers were tested for temperature during the holding period by means of thermocouples and the holding periods were checked by timing or color tests. The results of this work were very gratifying. The accompanying chart (Figure I) shows a comparison of the percentage of compliance with some of the more important regulations just before the amendments went into effect and after they had been in effect about a year.

All pasteurizing equipment which could not be satisfactorily remodeled is

reported as of unapproved type. The 22 plants having such apparatus all installed new pasteurizers of satisfactory type. The equipment of pasteurizers with indicating thermometers was a new requirement and almost complete compliance was promptly secured. The 5 per cent non-compliance represents for the most part plants that had secured indicating thermometers which were found broken upon later inspection. These were promptly replaced with new thermometers. Pasteurizers which formerly had outlet dead ends were either replaced with new equipment or, where practicable, satisfactory flush or

close coupled leak protector outlet valves with sterilizing connections were installed. Leaking inlet valves were replaced by leak protector valves. As indicated by Figure I, other important improvements were made.

One very gratifying result of this work has been the increase in the consumption of pasteurized milk in the state. Between January 1, 1928, and January 1, 1929, the number of pasteurizing plants under our inspection increased from 518 to 646. This increase in the number of pasteurizing plants and a general increase in the amount of pasteurized milk sold by other plants gave a small but marked increase in the percentage of pasteurized milk consumed. We believe that to increase the proportion of properly pasteurized milk consumed as compared with raw milk is one of the most important accomplishments of any milk control program from the public health standpoint.

In addition to the progress made in increasing the efficiency of pasteurization and the use of pasteurized milk, material progress has been made in improving the quality of raw milk. The amended regulations eliminated Grade C milk and made Grade B raw milk a temporary grade which could be sold only in the interval between making official application for a tuberculin test and obtaining the test. Fixing the maximum bacteria count of raw milk at 30,000 and at the same time requiring that bacteria counts be made the basis for grading have materially improved the quality of raw milk.

A thorough investigation of certified milk production was also made last year. This survey showed that certified milk producers generally were making an honest effort to meet requirements. County Medical Milk Commissions formerly were not under health department supervision and many commissions were found to be very lax in the performance of

their duties. The amended New York State Code requires that each county medical milk commission shall make a monthly report upon its activities to the state department of health. The department has insisted that these reports be submitted regularly for checking so that there is assurance that important safeguards such as veterinary examination of cows, tuberculin tests and medical examination of milk handlers are being applied.

A conference between the Governor's Agricultural Advisory Committee, the State Department of Health, health officials of various communities throughout the state, and representatives of the milk producers and distributors was held early this year to discuss milk control. As a result a law was passed specifically charging the state commissioner of health with the duty of protecting and promoting the health and welfare of the people of New York State by inspecting, regulating and supervising the sanitary quality of milk and cream distributed, consumed or sold within the state, whether produced within or without the state. This law also provided funds for adding 11 milk control specialists to the department staff and for purchasing and equipping two mobile milk laboratories in addition to other necessary equipment. This law specifically provided that the department

... make a complete investigation, study and survey within and without the state, to determine, among other things, the following: (a) the present sources of supply of milk and cream for household consumption and for manufacturing purposes and the amount produced by such sources; (b) the adequacy of existing state and municipal machinery for the enforcement of sanitary regulations and the extent to which impurities have escaped detection and prevention; (c) the proper state or local agencies or combination of agencies to be entrusted with the duties and responsibilities of effective sanitary control and inspection of milk and cream in their various local and state-wide phases; (d) the probable cost to the state of adequately enforcing the rules

and regulations of the commissioner and the public health council; and (e) such other information relative or pertinent to the functions of such Bureau [of Milk Sanitation] as the commissioner may request.

The public health council, which is the body charged with enacting the provisions of the sanitary code, enacted further amendments to the code this year as indicated hereinbefore. These amendments were designed to raise further the standards of milk and cream in so far as the experience of the past 2 years indicated that it was practicable to do so, and completely revised the cream regulations providing for the grading thereof. The regulation covering the sale of milk and cream shipped into New York State was also revised to make it necessary to produce and handle such milk or cream in conformity to the requirements of the New York State milk code and to subject it to the same standards of supervision and inspection as are required for milk or cream produced within the state.

Among the regulations which were increased in stringency is one requiring that health officers may not issue permits for the sale of pasteurized milk or cream until

... officially notified that the plant in which such milk or cream is pasteurized has been inspected as to apparatus, sanitary conditions and efficiency of operation by an authorized representative of the State Department of Health and that in these respects at the time of inspection the conditions found were such as to warrant issuance of a permit.

A new regulation relating to mastitis was inserted in the milk code providing that producers immediately report inflamed conditions of the udders or teats

of cows and exclude the milk from such cows. These regulations were enacted May 19, 1930, and became effective July 1, 1930.

Considerable time has been consumed in organizing the new staff and in securing and equipping the two mobile laboratories. This work has, however, now been completed and the laboratories are in operation in the field surveying the milk supply of the state. The schedule under which they are working will make it possible to cover the state by the middle of December, 1930.

In summarizing the progress made in the enforcement of the New York State milk code, we can say (1) that marked improvement has been made in milk control in most New York State cities; (2) that the employment of county milk inspectors is being stimulated by offering state aid and is tending to materially improve enforcement work in the smaller communities; (3) that grading of milk chiefly on the basis of bacteria counts has done much to increase the quality of the raw milk supply; (4) that the checking of monthly reports of county medical milk commissions has improved the status of certified milk; (5) that the improvements made in pasteurizing plant equipment and in methods of operation taken together with the increase in the consumption of pasteurized milk represent valuable public health protection; and (6) that the increase in the state appropriation for milk control work has made it possible to devote more attention to the work of advising, supervising and stimulating the milk enforcement work of local health officials, which should mean still more progress in the near future.

INDUSTRIAL HYGIENE

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Carbon Monoxide Poisoning in Industry—Winslow takes the position that carbon monoxide ranks first, and lead second, among the industrial poisons. The Bureau of Industrial Hygiene, in this study, has directed its attention primarily to the effects of prolonged exposure to relatively low concentration of the gas rather than to acute asphyxia. The examination of a representative number of workers constantly exposed and a review of the voluminous literature of the subject constitute the main purposes of the present investigation.

In connection with carbon monoxide poisoning, the physiology, pathology, symptoms, diagnosis, and prognosis, comprise Part I with a discussion of 80 pages, including several tables. The carbon monoxide hazards in industry comprise Part II, which discusses sources, control of the use of gas heated appliances, the operation of the internal combustion engine, and the matter of compensation (some 60 pages). Part III, entitled "Medical Control of the Carbon Monoxide Hazard," is concerned with the physical examination of 50 garage workers, the medical supervision of workers, and the treatment of acute cases of carbon monoxide asphyxia (about 55 pages). There follows a valuable Appendix in which the methods for the detection of carbon monoxide in the air and in the blood, the gas masks, and forms for recording histories and examinations, are delineated. There is a Bibliography of 182 grouped references, of which 139 are upon carbon monoxide and the balance upon ozone. Some 26

tables, 8 charts, and 29 illustrations accompany.

Of value, particularly, is the discussion on exposure to low concentrations of the gas over considerable periods of time, as well as case histories and the control of the hazards in industrial process. Compensation procedure is illustrated by case citations and a classification of different forms of death claims. Table XIV, which is an infold, groups the symptoms, physical findings, and blood findings of 50 garage workers. The illustrations are of a rather new type in connection with the descriptions of carbon monoxide poisoning and of distinct educational value.—May R. Mayers, M.D., Bureau of Industrial Hygiene, New York State Department of Labor, *Special Bull.*, 1930, 243 pp.
E. R. H.

Claims Filed for Occupational Diseases, Ohio, 1927-1929—In 37 pages of tables are given the experiences of the Industrial Commission of Ohio with regard to occupational disease claims and their compensations during the 3-year period, 1927-1929. The tables are classified by industry, by types of diseases, by days lost, by compensation cost, by medical cost, with a separate grouping for claims disallowed with the nature of the diseases concerned.

There was a total of 3,229 claims filed, of which 561 were found non-compensable. The total includes 70 fatal claims, of which 52 were non-compensable, leaving 18 claims which were considered compensable. Of these, 15 were

due to lead poisoning, 1 to brass or zinc, 1 to benzol, and 1 to petroleum products. Diseases of the skin recorded 2,060 cases, of which 6 were cancerous, due to pitch or tarry compounds. In only 793 of the skin diseases was there a disability of more than 7 days, i.e., 61 per cent had no compensable disability. The total number of days lost because of skin diseases was 39,020.

There were 89 claims for compressed air illness, most of them filed for medical treatment of painful conditions such as "blocked ears," painful teeth and neuralgia rather than real compressed air illness.

There were 450 claims for mineral poisonings, of which 441, including 15 fatal claims, were attributed to lead poisoning; the balance to brass or zinc. In 391 claims for lead poisoning, there was a loss of over 7 days, while in 35 it was 7 days or less. This would indicate that in one out of 12 claims there was a loss of less than 7 days, but if the loss was more than 7 days, the average period of disability was found to be about 87 days per case. The total number of days lost for the 441 lead poisoning cases was 124,196. From the standpoint of time lost, lead poisoning is the most serious of the occupational diseases encountered.

On July 21, 1929, tenosynovitis and prepatellar bursitis were added to the list of compensable occupational diseases, and since that time 26 cases were filed and found compensable, 12 for the former and 14 for the latter affliction. The total number of days lost was 671 and the compensation cost for the 26 claims was \$1,381.

Of the 561 claims which were filed for conditions not compensable under the Occupational Disease Law, 61 were for tuberculosis, 15 for asthma, 33 bronchitis, 52 for various poisonings, such as carbon monoxide, cyanide, chromium, etc., 44 for various infectious or contagious diseases, including scarlet fever, syphilis, pneumonia and various bacterial and parasitic diseases; 148 for various inflamma-

tory conditions of different parts of the body; 25 for neuritis, 8 for circulatory diseases involving the heart and arterial system; while 52 death claims were included in this group of non-compensable claims.

The table on costs shows a total compensation cost of \$278,515, or an average of \$104 for each compensable claim including the 18 death claims. The total medical cost is \$87,614, or an average of \$32 for each compensable claim.—

—Industrial Commission of Ohio, *Special Bull., No. 2*: 42–81, 1931. E. R. H.

Deep Mine Ventilation—There is a limit to acclimatization in moist temperatures which the writer, in his own case, some years ago, determined to be in a vicinity of 88° F. wet bulb. Beyond that the body temperature begins to rise continuously though slowly. In addition to the rise of body temperature, men in very hot places also suffer from what is really poisoning by water. During sweating the body is constantly losing salt as well as water, since the sweat contains about $\frac{1}{4}$ per cent of salt. A sufficient supply of salt, therefore, in either the food or drinking water, prevents ensuing trouble. About $\frac{1}{4}$ per cent of salt should be added to drinking water.

It is probable that the silicosis risk in dry air could be avoided if there were added to the quartzite dust another kind of dust with the property of rendering the silica harmless. Thus in British coal mines, the stone dust, which is either present naturally or is added in order to prevent explosions, does not produce miners' phthisis, though it contains about 35 per cent of quartz and nearly 60 per cent of total silica. The cost of dusting would probably be small in relation to diminished costs in other directions. One of the advantages is the abolition of risk of hookworm infection, and another, the very low death rate from tuberculosis (as experienced in British coal mines).

The next paper by the same author,

on "The Avoidance of Silicosis with Dry Methods of Working," points out that in the Rand mines keeping everything wet has not been an advantage so far as tuberculous infections occur, and that there is at present every reason for concluding that the dust danger in the mines could be overcome by the use of dry methods. This is especially so in face of the constantly increasing temperature encountered as the shafts reach lower levels.—J. S. Haldane, *Journal, Chemical, Metallurgical and Mining Society of South Africa*, 30, 2: 51-58 (Aug.), 1929. E. R. H.

A Study of Ventilation and Respiratory Illness in New York Schools; Comparison of Window-Gravity Ventilation and of Unit Fan Ventilation with Varying Air Flow—As in our Syracuse studies (Contributions Nos. 2 and 3) it appears that when school populations are balanced as to age, sex and nationality stock, and when the personal equation of the observer is held balanced, concordant and consistent results may be obtained from a study of school absenteeism and of respiratory illness among pupils in attendance.

A study of the health of pupils in schoolrooms ventilated by unit ventilators shows that reducing the rate of air flow from the standard figure of 30 cu. ft. per pupil per minute to approximately one-half that amount was not attended by any harmful effects so far as could be observed. In our experience the teachers preferred the rooms with low air flow on account of freedom from drafts and the lessened noise of the unit motors.

A comparison of schoolrooms ventilated with unit ventilators and of those ventilated by window-inlets with gravity exhaust shows that the simpler gravity process is quite as satisfactory from the health standpoint as is the system involving the use of fans.—Rufus Cole,

D. D. Kimball, F. S. Lee, G. T. Palmer, E. B. Phelps, E. L. Thorndike, and C.-E. A. Winslow (Chairman), *Am. J. Hyg.*, XIII, 1: 235-255 (Jan.), 1931.
E. R. H.

Heat Injuries Among Native Miners in the Witwatersrand Gold Mines—The critical heat point for man lies at an air temperature of about 90° F. wet bulb in the absence of appreciable air movement. In many of the deeper workings of the mines, men are exposed at air temperatures even beyond the critical point. Thus at a depth of 8,010 ft. the rock temperature was recorded at 101.2° F., the dry bulb, 94.2° at the drive face with machines working, and a relative humidity of 90 per cent, while at the top section of working stopes the dry bulb reached 96.2° and the relative humidity 95 per cent. With some 10,000 men, more or less, exposed to these conditions, there occurred, in 12 months, 12 cases definitely diagnosed as heat strokes of whom 6 died.

The principal symptoms exhibited by the victims were: Temperature 102° to 107°, axillary, but it is noteworthy that a few cases had a temperature of only 99° to 102°. Pulse 100-120. Dyspnea. Dry "burning" skin. Unconsciousness. Sometimes delirium and great violence were exhibited; one case was stated to require seven men to restrain him. Convulsions were present in most cases; in one there was a spasm similar to that seen in hydrophobia, so that he was unable to swallow. This is the nearest approach to "heat-cramp" of which I have a trustworthy record.

The majority of cases of severe stroke occurred in new workers. After the first week or two, gradual acclimatization takes place. Post-mortem, the striking lesions observed were edema of the lungs and brain, with acute congestion of these organs.

In the discussion, Dr. Hans Pirow, Government Mining Engineer, pointed out that the native laborer serves for a very short period and is then replaced

by another, so that in any one month they may deal with 10,000 or more new recruits, and the whole native labor complement is changed within a period of some 18 months. The question naturally rises whether the same standards of comfort are applicable to different types or races of natives. (A considerable important discussion follows, particularly in regard to advisability of decreasing wet methods and adopting Dr. Haldane's idea of dry methods through the mixing with the silicious dust of some harmless dust, since the wet methods now after a considerable number of years have not succeeded in eliminating miners' phthisis. At the Mysore mine, this result was alleged to have been attained, and he thought the method worthy of further trial.)—A. J. Orenstein, M.D., *Journal, Chemical, Metallurgical and Mining Society of South Africa*, 30, 2: 66-74 (Aug.), 1929. E. R. H.

Miners' Phthisis on the Rand—(We abstract only a couple of features from this valuable article.) The "New Rand Miners," meaning those especially selected since 1916, now number 8,300 and are increasing each year. The attack rate for silicosis among all miners who were working in their 10th year of service was 5 per cent, while among the New Rand Miners it was only 1.3 per cent.

It takes nowadays, on the average, over 12 years' underground work to produce a case of silicosis. Of the 270 cases detected during the past official year, 90 per cent had begun work prior to August, 1916—prior, that is, to the beginning of the present-day period.

While it is felt that a big corner has been turned in the matter of silicosis, it is not anticipated that the actual number of cases detected will show significant further decrease in the immediate future. After years of hard work on the part of mining engineers and inspectors and mine officials and medical

men, a large measure of success has been attained. But it is incomplete. When, in 1916, it was found that the liberal use of water would reduce the dust from drilling or blasting by as much as 98 per cent by weight, the problem appeared to have been solved. It was only solved *so far*. Have we not been overdoing water? Could we not do better with less water and a greater extension of alternative methods? (The dry dusting method of Dr. J. S. Haldane is then referred to.)—L. G. Irvine, M.D., and A. Mavrogordato, M.D., *Journal, Chemical, Metallurgical and Mining Society of South Africa*, 30, 2: 163-168 (Nov.), 1929. E. R. H.

Foundry Ventilation—The rules of the New York Industrial Code as enforced by the Department of Labor for the removal of smoke, steam, gases and dust, and for coremaking rooms in which women are employed, are reprinted, discussed, and methods of compliance illustrated.—John H. Vogt, *Indust. Hyg. Bull.*, New York State Department of Labor, 7, 9 and 10 (Mar. and Apr.), 33-34, 37-39, 1931.

E. R. H.

Compounding Materials Used in the Rubber Industry (Classification and Health Hazards)—The various substances used as accelerators, antioxidants, and dry organic compounds, are grouped as to toxic or irritant properties, and then arranged in alphabetical order and discussed. Special references are made to other Safe and Health Practices Pamphlets.—National Safety Council, *Indust. Safety Series* No. Ru. 1, 1931, pp. 16. E. R. H.

Benzol—The purpose of this pamphlet is to describe the principles used to protect the health of workers exposed to benzol. There are two distinct types of uses recognized, (1) that in closed systems of pipes or tanks, and

(2) in open processes. Benzol poisoning is briefly discussed as acute or chronic poisoning, with the most important diagnostic signs, also steps in medical supervision. Exhaust ventilation is discussed with diagrams and illustrations, while an Appendix is devoted to fire and explosion hazards.—National Safety Council, *Health Practices Pamphlet*, No. 14, 7, 1931.

E. R. H.

The Effect of Prolonged Exposure of the Siliceous Spicules of a Fresh-Water Sponge (*Spongilla Fragilis*) to the Action of Animal Tissues: A Contribution to the Pathogenesis of Silicosis in Man—The spicules of the fresh water sponge, *Spongilla fragilis*, are composed of opal, a form of hydrated silica, which is similar to quartz in its chemical reactions. These spicules, when introduced into the tissues of animals, are slowly but definitely dissolved, proving conclusively that silica is soluble in the tissue fluids of animals, and presumably of man. This confirms the assumption held by many students of silicosis that particles of siliceous material are gradually converted into the colloidal state and as such exert a fibroplastic influence on the lungs of miners and other exposed industrial workers. Definite fibrosis of the lung of a dog into which the spicules had been introduced suggests that there is a concomitant injury attributable to the disappearance by solution of the siliceous elements of the spicules.—Ralph G. Mills, *Am. J. Hyg.*, XIII, 1: 224-233 (Jan.), 1931.

E. R. H.

Ultra-Violet Radiation and Resistance to Infection: Intranasal Infection with the Pneumococcus and with Bacterium Lepisepticum in the Rabbit—Three experiments with exposure to

direct sun or north skylight through vitaglass showed that both the percentage of infection and the morbidity rate after inoculation with pneumococcus type I was higher in the irradiated animals than in the control group kept inside.

Similar experiments performed with mercury arc radiation and infection with *Bact. leipsepticum* showed that radiation had no effect on the susceptibility to infection, although the mortality rate was somewhat lower in the irradiated group.

A variation in the amount of ultraviolet, from a marginal erythema to a heavy but subulcerating dose, had no correlation with resistance to the respiratory infections used.—Mary Hardy and Jeannette Chapman, *Am. J. Hyg.*, XIII, 1: 255-280 (Jan.), 1931.

E. R. H.

Laboratory Aids in the Diagnosis of Lead Poisoning—Summary—

1. Laboratory methods for diagnosis in lead poisoning are valuable in any case, essential in the majority. They are not in themselves diagnostic but complementary to clinical examination including history.
2. In every case blood examination, including hemoglobin estimation, red blood count and examination of the stained smear, should be carried out.
3. Quantitative estimations of lead in the urine should be routine practice.
4. Public institutions such as public health laboratories should be in a position to make these estimations for the general practitioner.
5. In industrial work periodic examination of blood smears stained to demonstrate stippling in the red cells is a convenient and efficient method of checking exposed workers and, with practice, assists the industrial physician to place his staff of workers so as to avoid the more severe manifestations of lead poisoning among them.

—A. R. Riddell, *Canad. Pub. Health J.*, 22, 3: 138-142 (Mar.), 1931.

E. R. H.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

The Effect of Heat upon the Biological Value of Cereal Proteins and Casein—The first experiments by the authors were made upon certain prepared breakfast cereals. Rats 21 to 28 days old and weighing 35 to 60 gm. were used as test animals. Wheat, rice, and corn were tested alone and supplemented by small amounts of casein.

White bread was compared with the same toasted in $\frac{1}{4}$ " slices at 150° F. and bread crust similarly compared with the corresponding crumb. In each case, the toasted product caused less total growth and less growth per gm. of protein eaten. When 5 per cent of raw casein was added the discrepancy caused by the heat treatment largely disappeared.

Puffed wheat produced but little growth. Cracked wheat was then fed raw, toasted, and water-cooked. The growth value of the water-cooked was better than that of the raw, and both were greater than that of the toasted. Caramel formation during toasting was found to account for only a small part of the injury.

Raw cracked rice provided excellent growth but puffed rice gave far less growth.

Raw ground yellow corn gave less growth than did wheat, and toasted corn flakes gave less growth than raw corn.

When young rats were fed diets containing raw and toasted wheat gluten as source of protein at 9, 12, 15, 18, 21, and 24 per cent levels in a diet otherwise adequate, the growth in 56 days was found to be 1.29 to 1.40 per cent per gm. of protein eaten in the case of raw gluten at all levels up to 18 per cent, and to fall to 1.15 and 0.98 at the

21 and 24 per cent levels. The corresponding figures for toasted gluten were 0.94 to 1.09 and 1.12 and 0.86. The maximum growth rate on both raw and toasted diets was at the 18 per cent level, but the toasted gluten supported less growth than the raw both absolutely and relatively to the amount eaten at all levels.

When large mature rats were used for a similar study of raw and toasted wheat gluten at a 6 per cent level, the values found were 83 and 64 and in another test with raw and toasted casein at an 8 per cent level the biological values found were 66 and 53.

The digestibility of the toasted proteins was but little different from that of the raw, particularly in the older animals, and the unexplainable loss of nitrogen occurred chiefly in the urine, indicating that the change produced by the heat treatment lies probably in the assortment or availability of the amino acids absorbed.—Agnes Fay Morgan, *J. Biol. Chem.*, 90: 771 (Mar.), 1931.

Magnesium Starvation — Magnesium is present in many chemicals and in some drugs and is a necessary part of the normal diet, but how necessary it is and why has only recently been discovered by Drs. McCollum and Orent and reported by them at the Montreal meeting of the American Society of Biological Chemists. These doctors found that 11 days of a diet wholly lacking in magnesium caused convulsions and death in the majority of rats. On the 3d day of the magnesium-free diet the rats developed bright red ears and tails. On about the 10th day and never later than the 11th day the animals behaved

strangely. Slight noises agitated the rats so greatly that they whirled around two or three times and collapsed. Their breathing was disturbed, their eyes protruded and the blood rushed away from the vessels just under the skin so that the ears and tails were blanched. Eighty-five per cent of the rats died in the spasm, the remaining 15 per cent living on indefinitely, some as long as 90 days. When magnesium is omitted from the diet, calcium and phosphorus are drained out of the body so that not enough is left to make an X-ray of the skeleton. Dr. McCollum believes that this is explained by the fact that there is much the same relation between the adrenal glands and magnesium as there is between the thyroid gland and iodine or the parathyroid glands and calcium.—*Science*, 73, 1894 (Apr. 17), 1931, *Science News*, p. 10.

The Association of Vitamin A with Greenness in Plant Tissue.
III. Vitamin A Content of Asparagus Grown under Light of Various Qualities—In two former reports (Abstract, *A. J. P. H.*, Nov., 1927, and May, 1929) the authors submitted data leading to the conclusion that there is a relationship existing between the vitamin A content of plant tissues (lettuce and asparagus) and their degree of greenness.

The experiment reported here gives added support to the belief that in some manner or other the elaboration of vitamin A in the plant is connected with the development of the chlorophyll pigment.

Asparagus was chosen as the test plant. Twelve light filters were set in three frames and placed over the plants. A fourth frame was covered with Vita glass.

The laboratory procedure was practically the same as that of previous experiments. Albino rats were placed on a vitamin A-free ration, and when depleted of this vitamin were fed aspara-

gus taken from the region just below the terminal bud of the stalk. Growth was determined over a period of 8 weeks. This was in the 1929 season. Since the supply of tips was too limited to be used for other purposes the frames were set up again in 1930 and the tips used for determination of chlorophyll, amino acids, water-soluble nitrogen, and inorganic elements.

From the data on the chemical composition of the tips and the gains of rats in this experiment, it seems reasonable to conclude that within the restriction of the two variables expressed by some non-linear relationship chlorophyll content is a limiting factor on vitamin A synthesis in the vegetative parts of the plant. This gives point to the contention of a previous investigator (*Science*, 68, 48, 1928) that further progress in a knowledge of vitamin A may depend upon the industry and the success of the biochemists and the plant physiologists in the efforts to solve mysteries of chlorophyll and its functions.—John W. Crist and Marie Dye, *J. Biol. Chem.*, 91: 127 (Apr.), 1931.

The Use of Cottonseed Meal in the Diet of the Rat—These experiments were undertaken to establish evidence for the contention that cottonseed meal contains physiologically active gossypol in amounts sufficient to influence the growth and well-being of rats.

In these controlled feeding experiments, advantage was taken of the previously acquired information that iron salts are efficacious against gossypol injury and that gossypol is destroyed when heated to high temperatures in the autoclave.

The basic diet, containing cottonseed meal to which different amounts of iron salt were added, consisted of cottonseed meal (standard or autoclaved), yellow corn, wheat, alfalfa, NaCl, and CaCO₃.

A table gives the gain during successive 30-day intervals of rats on cottonseed meal diets supplemented with

iron. During the first 60 days all animals made normal gains but during the last 60 days of the experiment the rats receiving the standard meal without the iron additions almost invariably made smaller gains than the rats receiving the autoclaved meal. Marked improvement in growth resulted from the addition of iron (1 to 2 per cent of ferrous sulphate) to the standard meal.

At the close of the experiment the unhealthy condition of rats on the standard meal was very noticeable. At times the animals became extremely nervous or excited and breathed rapidly. The female rats appeared more susceptible to injury than the males.

Improvement in the growth and well-being of animals fed upon cottonseed meal diets was brought about in two ways: first, by administering inorganic iron, and, second, by replacing the ordinary meal in the diet with an autoclaved product which contains little, if any, active gossypol.—Willis D. Gallup, *J. Biol. Chem.*, 91: 387 (Apr.), 1931.

The Induction of Tetany in Rachitic Rats by Means of a Normal Diet—For many years the common method of inducing experimental tetany has been the removal of the parathyroid glands following which the calcium concentrate of the blood falls and the animal develops convulsions.

Another method is the feeding of large amounts of phosphates. Neither of these is satisfactory since they do not

resemble clinical tetany. The most common form of tetany is that which occurs in infants and an attempt was made by the authors to induce tetany in rachitic animals by means of a ration which approximated as nearly as possible the normal dietary of the infant.

Detailed descriptions and tables are given as to the experiments carried out. It was found that tetany can be induced in rachitic rats simply by an abrupt change from a rickets producing ration, high in calcium and low in phosphorus, to a normal ration of dried milk or of dried milk and whole wheat. The fall in calcium in the serum which is brought about by this means develops within 48 hours but is maintained for only a few days. This reaction is not due to an absolute nor to a relative increase of phosphorus in the dietary but to a sudden shift in the Ca:P ratio in the subsequent diet as compared to the preliminary diet. When this ratio of Ca:P is decreased from about 4:1 to 1, or 1.5:1, tetany ensues, whereas if it is decreased only to about 2:1 the fall in calcium and nervous symptoms do not come about.

Attention should be directed to the effect of marked alterations in the constitution of dietaries, as such shifts may help to explain nutritional disturbances which are not explained from the standpoint of adequacy.—Alfred F. Hess, Mildred Weinstock, H. R. Benjamin, and J. Gross, *J. Biol. Chem.*, 90: 737 (Mar.), 1931.

CHILD HYGIENE

RICHARD A. BOLT, M. D., DR. P. H.

PREVENTIVE DENTISTRY

A PROFOUND change is taking place in what was formerly considered preventive dentistry and mouth hygiene. In the past we have been occupied largely with the exploration of children's teeth—mainly during the school years—and the recording of numerous defects. An intensive program of pulling and patching was instituted and the children were instructed by tooth brush drills to believe that "a clean tooth never decays." Year after year this program was continued, and year after year we found about the same number of children entering our schools with defective teeth. The disturbing feature of this situation is that in a considerable percentage of these school entrants the first permanent molars have decayed beyond repair. This, as we know, may lead to various forms of malocclusion and systemic disorders.

So long as dentistry proceeded upon the theory that there was plenty of work for the dentist if he confined his practice to older children and adults, little progress in preventive dentistry could be expected. Fortunately the profession had a number of men, imbued with the research spirit, who were venturesome enough to attack the problems of the preschool child from all sides and even to peer into the mysteries of the prenatal period. From a knowledge of the embryonic growth and development of the jaws the first hints as to a more rational method of attack on problems connected with dental structure arose. This pioneer work in dental histology and pathology opened the way to clearing up many hitherto obscure points. But the greatest progress in clearly un-

derstanding the processes of growth and decay of the teeth has come in the last 10 years. During that time painstaking researches in the relation of nutrition to the teeth have been made. This work has been so carefully developed, and the check of one investigator upon another has been so thorough, that we may now point with a definite degree of assurance to the rôle of diet in preventive dentistry.

A painstaking review¹ of this subject, which it would profit every health worker to read carefully, appeared in the early part of this year. In this editorial review Dr. Hanke begins by pointing out that dental caries, pyorrhea alveolaris, and inflammation of the soft oral tissues have been known from the dawn of history and that man has held all sorts of theories concerning their causes. Man has also resorted to many fads and fancies to prevent and cure dental disease. In this article Dr. Hanke attempts to dispel present-day popular misconceptions. In summing up the evidence from antiquity he says:

These studies of the conditions that existed in ancient Egypt are instructive because they show that:

1. The mastication of coarse food does not prevent dental caries, suppurative periodontitis, nor pyorrhea; but it does wear down the teeth.

2. Unrefined grain does not contain mysterious substances that prevent dental disorders.

3. These dental diseases were associated with a diet that was predominantly carbohydrate, and was probably markedly deficient in vitamin C, and that was not necessarily inadequate in vitamin D.

4. Dental diseases are certainly not the outcome of modern civilization. (Although dietary deficiencies in the modern diet may be one of the factors, if not the main factor in dental decay as we see it today.)

It is pointed out clearly that "the changes observed in the teeth, the supporting structures, and the gingival tissue are considered to be metabolic in origin and not due to some local disturbance." If this is the case, as many investigators now believe, then the task of preventive dentistry is so to order the dietary of the pregnant woman and the infant as to make possible the proper growth and calcification of the teeth. Milk, green leafy vegetables and citrous fruits should be basic items, therefore, of the diet given the prospective mother.

Dr. Hanke also states that "poorly constructed teeth, delayed and irregular dentition, and slow development of the jaw bones frequently occur in children that have rickets." This lack of development, of course, predisposes the dental structures to disease. Experimental work with rats and dogs has made it possible to reveal some of the abnormal processes in tooth structure and shows that hypoplasia of the teeth leads to early decay in many instances. After a review of the work relating to scurvy, Dr. Hanke is convinced that

These considerations justify the conclusion that a deficiency in vitamin C may be a very important factor in producing pathological changes in the pulp, in the periodontal tissue and in the gingival tissue. This immediately throws a new light upon dental diseases and releases us from the shackles of the rather hopeless outlook that dental caries is a purely chemical process occasioned by the products of bacterial fermentation and that spongy gingival tissue and pyorrhea are due primarily to the ravages of bacteria that can hardly be removed from the mouth. It lays stress upon the metabolism of body cells. If we can produce healthy cells by proper nourishment, we can often eliminate the bacteria from the infected areas and keep them outside of the confines of the tissue.

While this last statement may lean toward too much optimism, it certainly makes the assumption that diet is a primary factor in dental hygiene appear worthy of following.

The most helpful suggestions arise

from the recent works of Sherman Davis; Boyd, Drain, and Nelson; and Bunting, Hadley, Jay, and Hard. All of these investigators stress the necessity of an adequate dietary although there are some differences in the details. For the child they recommend at least a quart of milk daily, one egg, a teaspoonful of cod liver oil, one ounce of butter, one orange, two or more servings of green vegetables and of fruits, and in addition any food the child enjoys which will go to make up the total caloric intake.

These investigators state that

Dental caries was arrested even when the major portion of the diet consisted of carbohydrate. This statement, which is in perfect accord with our own experience, calls for serious reflection on the part of many dentists, dietitians and biochemists who have persistently maintained that dental caries is the direct result of the over ingestion of carbohydrate. Many people ingest carbohydrates to the exclusion of the essential foods and the deleterious results of such nutritional habits may be due to the lack of vitamins and minerals rather than to excessive ingestion of carbohydrate.

The dental journals of the day carry articles calling attention to the newer knowledge of nutrition. The special care of the teeth during pregnancy is now looked upon as essential, not only for the sake of the prospective mother, but also for the developing fetus. Two recent issues of the *Dental Survey*² feature preventive dentistry from this modern viewpoint. Dr. Fairchild remarks:

To my mind prevention is the only solution of the pyorrhea problem. Ionization, emetine, vaccines, instrumentation, and drugs have all failed, but proper food has definitely given results. What a splendid thing it will be for humanity if children can be given the wonderful asset of fully developed jaws and soundly constructed teeth.

During the last year the *Journal of the American Dental Association* has presented a number of articles dealing with preventive dentistry and has set forth in its section on Health Education

many helpful hints of an educational nature.

The dentist and the physician must coöperate fully in extending the modern program for mouth hygiene and preventive dentistry. This must begin with definite prenatal instructions and continue until the full complement of teeth has arrived. If dentists can be brought to take as much interest in the preschool child as they now do in the school child

we may look for a great advance in mouth hygiene.

REFERENCES

1. The Rôle of Diet in the Cause, Prevention, and Cure of Dental Disease. Editorial Review by Milton Theo. Hanke. *J. Nutrition*, III, 4: 433-451 (Jan.), 1931.
2. Fairchild, J. S. Dieting to Prevent Pyorrhoea, *Dental Survey*, VII, 4: 39-41 (Apr.), 1931.
LaVake, R. T. Care of Teeth During Pregnancy, *Dental Survey*, VII, 4: 42-44 (Apr.), 1931.
Howe, Percy R. Diet to Prevent Dental Caries, *Dental Survey*, VII, 5 (May), 1931.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

Where Do You Turn When You Want a Public Health Nurse?—One of the agencies to turn to is the Joint Vocational Service, Inc., 130 E. 22d Street, New York City. Here 4 years ago the social workers and public health nurses brought together their vocational centers.

Joint Vocational Service is not organized for profit; it is not even self-supporting, though the percentage income from registrants' placement fees and from subscriptions made by organizations using the Service is increasing year by year. About two-thirds of the volume of work has been in the social work field.

Due to the increasingly close relationship between social work and public health nursing, their united effort in conducting a vocational agency has proved more and more advantageous. The Service has also been working closely with the Education Committee of the National Organization for Public Health Nursing.

In the past 4 years nearly 2,600 public health nurses registered or re-registered with the J. V. S. Of these about three-fourths were high school graduates, and most of the high school graduates had had college work also. Nearly 500 were college graduates, and many of these had taken postgraduate work.

During 1929 and 1930, J. V. S. filled 492 public health nursing positions and assisted in filling 125 more. The percentage of placement in public health

nursing has been higher than in the social work field, probably because it is more nearly standardized.

In the past year the number of available positions in public health nursing declined 15 per cent. The decline was most noticeable in beginning staff positions and in executive positions.

Most of the positions filled were in the area around New York City, but the agency has also been reaching out through the country. The number of positions reported from the Mid-west and West have increased considerably.

J. V. S. has filled public health nursing positions at salaries ranging up to \$5,000 but the largest number of positions without maintenance offered about \$1,800; with maintenance about \$1,200. Comparatively few positions without maintenance have offered \$2,600 or over; few with maintenance have been available at \$2,000 or over.

—*Report of Progress, Joint Vocational Service, for year 1929-1930, pp. 1-4.*

Something New in School Nursing—School nurses in New York State are now called school nurse-teachers. They are certified by the teacher training division of the State Educational Department and must have the following qualifications:

1. Graduation from an approved four year high school course or its equivalent
2. Graduation from a nursing school registered by the regents of the university
3. Certification as a registered nurse in New York State
4. Completion of at least 6 semester hours in approved professional courses in health education

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

The term "health teacher" no longer applies to a school nurse-teacher. A "health teacher" must have completed the professional requirements in general teacher-training courses covering a minimum training period of 3 years, specializing in the field of health and hygiene. Nurses' training is of value but is not a requirement.

There should not be more than 1,500 school children to one school nurse-teacher, and in rural districts where the distances are greater, 500 are often as many as a school nurse-teacher can serve.

The trustees or boards of education of two or more districts may unite in employing a school nurse-teacher and where she meets the state requirements the state will pay half the nurse's salary, or \$700 as the maximum.

The school nurse-teacher never makes the annual medical examination; that, of course, must be made by the school medical inspector, but in the smaller communities, which he visits very infrequently, she gives most of the health service under his direction.

The education department has defined the function of the school nurse-teacher thus:

The primary function of the nurse-teacher shall be to assist the school medical supervisor (school physician or medical inspector) and other school officials in protecting the health of school children; by assisting in examining pupils; by rendering first aid service; by visiting homes; by making health inspections of the school plant; and by such other health protective duties as are permitted by law and may be prescribed by the board of education. The secondary function of the school nurse-teacher shall be to teach health habits and health information through contacts with individual pupils, parents, and teachers. The nurse-teacher shall not be regarded as a classroom teacher nor engage regularly in hygiene instruction in classrooms.

Usually the school authorities find it an economy to furnish the school nurse-teacher with some means of transportation. Often the correction of defects found by the school medical inspector cannot be secured without a

home visit by the nurse; in many ways the contact the nurse furnishes between the home and the school is a valuable feature. Without proper transportation facilities it must of necessity be very limited and very expensive.

The Education Department of Newark, N. J., has educational requirements for the school nurse similar to those of New York State.—Marie M. Ready and James F. Rogers, M.D., Legislation, Biennial Survey of Education in the United States, 1928-1930, U. S. Dept. of the Interior, Office of Education, *Bull. No. 20*, 1931, pp. 26-27.

A New Visiting Nurse Association—Student Nurse Combination—For some time certain nursing schools have had affiliations with public health nursing associations or visiting nurse associations to give senior nurses 2 months' training in public health nursing, but the Visiting Nurse Association of Brooklyn, N. Y., one of the earliest established in this country, has gone further even than this in affiliations as explained in the April *Survey*.

The association has formed a "pediatric affiliation" with two of the hospitals in the city to supplement their training of the student nurses in the care of children. At the present time the hospital experience alone is not sufficient to meet the requirements of the New York State Department of Education. The association gives a 6-weeks course to groups of 14 students at a time, consisting of about 8 days of observation in the homes with staff nurses, classes and demonstrations in the care of sick children in the home, and health supervision of infants and preschool children. Time is given for reference reading and for excursions to various health agencies interested in work with children. The remaining time is given to actual field experience and to case study of family health problems.

—The V. N. Teaches the Student, *Mid-monthly Survey*, Apr., 1931, p. 98.

Correspondence . Schools for Nurses—A timely article has been written by the Bureau of Publicity of the Indiana State Medical Association

that applies to the whole county and we are quoting it:

Becoming a trained nurse by correspondence is as impossible as learning to be an aviator in a bird store. Yet correspondence schools for nurses are in existence which advertise that by taking their courses a person may fit herself for nursing. Several such schools are established in the Midwest and the Bureau of Publicity of the Indiana State Medical Association receives many requests each year in regard to the value and standing of these institutions.

In answer to these requests the Bureau quotes from a bulletin entitled "A Fraud upon the Public—There Is No Angle from Which Advertising of Correspondence Schools of Nursing Can Be Justified," recently issued by H. S. Cumming, Surgeon General of the U. S. Public Health Service.

"To anyone who has ever needed the services of a nurse, the necessity for thorough training must be apparent. Thorough training cannot be and never will be possible through correspondence, for nursing is a profession requiring a technical skill in the performance of many difficult procedures which can come only from doing them over and over again. Yet one constantly sees advertisements of 'correspondence schools of nursing,' 'learn nursing in your own home,' etc.

"The trained nurse must know the ebb and flow of the vital forces. She must be familiar with the danger signals that mark the safe course to recovery. Her mettle must be

known by those who vouch for her. What will she do in some dramatic emergency in the operating-room, when quick team work is necessary, or in the silent watches of the night when alone in the ward she holds grave responsibilities? How shall a textbook, alone, describe the indescribable look on a patient's face in the split second preceding catastrophe, when life and death hang in the balance?

"Even the rudiments of nursing cannot be taught by correspondence. To attempt to teach nursing by correspondence is as impossible as it would be to teach medicine.

"No less great than the imposition on the public is the imposition on the young woman who is given to understand that this training is adequate for her to earn her living as a nurse.

"Many requests come to the Public Health Service for appointment in government service from graduates of correspondence schools. They are naturally not eligible for appointment; they cannot get any position under Civil Service, state or federal; their only hope is to receive calls from a private practitioner. Many young women also write this department asking whether a course in a correspondence school will fit them for nursing. In every instance they are advised to enter an accredited school of nursing."

—Correspondence Schools for Nurses, News Release, Bureau of Publicity, Indiana State Medical Assn., Apr. 27, 1931.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

CONVENTIONS—MEETINGS

The announcement of the annual conference of New Jersey health officials included the following:

Six New Jersey health officers will tell how they put across new plans last year. A wide variety of projects is to be covered by this group of talks, such as monthly letters to physicians, vaccination clinics, coördinating nursing activities, filing vital statistics, taking

a preschool census and conducting tuberculosis campaigns. These will be short stories of real accomplishments, not theories.

Yes, there will be a playlet. Last year's experiment was so successful that a new demonstration playlet has been prepared for everyone's enjoyment and edification.

If you give talks or demonstrations on nutrition be very sure to look up "How To Interest Men and Women In Nutrition," by L. A. Case. *Journal of Home Economics*, 101 East 20th St., Baltimore. Sept., 1930. 30 cents.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

Suggestions for Planning Meetings—American Nurses' Assn., 450 7th Ave., New York. A mimeographed outline. (It is dated!) Useful for staff or local group meetings. Section on "Planning a Meeting" could help a lot of meetings planned by health workers. The meeting outlines from Wisconsin seem entirely too full. The numerous "ten-minute discussion" topics call for high pressure methods. Surely they should be extended to 20 or even 30 minutes for anything like real discussion in a group. As planned they could only be handled as 10-minute speeches—and concise ones at that. It is good to note the increased use of detailed memoranda on specific work problems. *10 cents.*

"Health At Winter Meetings"—Connecticut Dept. of Health—outlines an offer to send speakers—lists topics and offers illustrative material.

A "Publicity Clinic," conducted by A. Schaeffer, Jr., Natl. Tuberculosis Assn., was a feature of Indiana Tuberculosis Assn. annual meeting.

"The Relation of School Nursing to Health Education," and "How the Nurse Can Aid Classroom Teachers in Promoting a Sound Program of Health Instruction"—topics in a School Nurses' Institute conducted by Connecticut State Dept. of Education.

Because of the World Federation of Education Assn. meeting at Denver, July 7–Aug. 1, with its Health Section, the American Child Health Assn. will not hold its usual Sayville conference this year.

BULLETINS—HOUSE ORGANS

These notes are intended to suggest topics and sources for copy, in addition to offering comment on typography and other details in getting up house organs.

Some of the bulletins issued more or less regularly—especially mimeographed issues—are dated, but lack number and volume. At least consecutive numbering would be a simple matter.

Guessing contest—which city health department uses 6 different kinds of type on the cover page of its house organ?

An early start in Iowa—a "Tourist Camp Sanitation" issue of *Iowa Public Health Bulletin*, State Dept. of Health. Jan.–Mar., 1931. *Free.*

Copy on automobile accidents may be found in the Apr., 1931, *Travelers Standard*, Hartford, Conn. *Free.*

A "news photograph" on the title page of Jan., 1931, *Bulletin*, Milwaukee Health Dept. A smiling girl—holding card ("How's Your Health?" etc.)—caption: "Start The Year With a Health Inventory." *Free.*

Effective use is made of several sentence statements on the lower half of the cover page of *Pittsburgh's Health*, Dept. of Public Health. The page would look better if the whole of that page could be set in the same type—using different sizes—with no italics. *Free.*

Better Health, Dept. of Health, Syracuse, N. Y. Mar., 1931. "Easter Greetings" cover design—purple ink—includes "Mother Goes to School" and "Ordinances You Should Know." *Free.*

"The Citizen and Health" (*Bulletin*, Milwaukee Health Dept. Feb., 1931) is a page abstract of Prof. Winslow's Fort Worth address—which address could be used widely to advantage for pointing out the minimum of public health knowledge for every citizen.

Dairy Council Digests—Natl. Dairy Council, 221 N. LaSalle St., Chicago. Monthly reports on diet research for those who wish the latest developments. *Free.*

"The Department of Health 38 Years Ago," by Dr. A. R. Reynolds, suggests an idea that would make an interesting article in many a town or county. *Weekly Bulletin*, Chicago Dept. of Health. Feb. 24, 1931. *Free.*
Baltimore Municipal Journal (Feb.

20, 1931) tells about "The Health of Our City 135 Years Ago—Today." In that day there was yellow fever. *Free.*

Harlem Health Bulletin, issued by Harlem Tuberculosis and Health Committee, 108 West 136th St., New York. A mimeographed bulletin on half letter size sheets, green paper, double red cross printed in corner of the top sheet. Contents illustrate activities in a Negro district, and a distinctive form of bulletin. *Copy free.*

The Michigan Sanatorium Assn. utilized the Jan., 1931, issue of *Michigan Out of Doors* (Michigan Tuberculosis Assn., Lansing) to acquaint the state with the tuberculosis sanatoriums. The body of the issue is made up of large page half-tones which "bleed" over the edge of the pages—descriptive text and smaller pictures on the right side. An 8" rule with 3 light rules at the right of the text cuts down length of text line—gives interesting effect. If readers "bleed" photographs we suggest that they try a grey or black 8" line on the inner edge of the photograph so that it won't seem to run under the opposite text page. *Free.*

The "Public Health Nursing" issue of *The Commonwealth* (Oct.–Dec., 1930), Massachusetts Dept. of Health, includes: "Education and the Public Health Nurse"—"Staff Education"—"Group Education in Small Communities"—"Post-Graduate Education"—"Parental Education in a Public Health Program." *Free.*

"Putting the Layman Wise on Cancer" is the theme of Feb., 1931, issue of *Health*, New Haven Dept. of Health. Fine title—good text in 2 short articles for the "Layman." *Free.*

Quarterly Bulletin, Frontier Nursing Service, Lexington, Ky., gets a pleasing effect by use of an ivory dull-finish paper. *Free.*

"Selling Health In Industry," by H. H. Keller. *Pennsylvania's Health*, State Dept. Jan.–Feb., 1931. What

the Bell Telephone Co. of Penn. does. *Free.*

Tidings is the multigraphed bulletin of the Division of Child Hygiene, Massachusetts Dept. of Public Health. The size, 5¾" x 8½", printed cover, some illustrations, stapled—gives an interesting variation from usual practices. *Free.*

EDUCATIONAL

"Food Plan for Family of Five at \$7.50 a Week"—Public Health Federation, 312 W. 9th St., Cincinnati. 4 pp. An inadequate emergency diet. *Free.*

"Health On The Farm and In The Village," by C.-E. A. Winslow. The pamphlet contains "Outstanding Lessons of the Cattaraugus County Health Demonstration," a chapter from the full report. Milbank Memorial Fund, 49 Wall St., New York. *Free.*

"The High Cost of Personal Neglect," by Dr. J. Clark, 114 East 54th St., New York. Reprint from *Hygeia*. Jan., 1931. A plea for periodic examinations. *Free from the author.*

"How To Train Your Baby To Keep Dry"—Massachusetts Society for Mental Hygiene, 3 Joy St., Boston. 4 pp. Good sample of size, paper, typography. *5 cents.*

"Illness and Dependency"—"Private Group Clinics"—two recent issues of Committee on the Costs of Medical Care, 910 17th St., N. W., Washington. *Free.*

"Lightning!"—Health Dept., Racine (One knows the city if one remembers Dr. Bauer's address!—not given on the folder). A good 4-page folder on smallpox. *Free.*

"We Ask Your Help!" (excluding child from school); "Pointing the Way" (reporting school physician examination)—school examination appointment card for presence of parent—Racine Health Dept. *Especially good text. Free.*

"Milk Every Meal: Morning, Noon,

Night"—College of Agriculture, Madison, Wis. 8 pp. *Sample free.*

A New Year's Greeting folder—contents adaptable for use anywhere at any time of the year—Public Health Nursing Out-Patient Dept. of Englewood (N. J.) Hospital. "Around the Day with the Nurse in Gray" in 7 photographs with *good captions*. 4 cents for copy.

"A Program of Life for All Who Desire to Live Long"—Alabama State Board of Health. 8 pp. Not dated. Fourteen points grouped under "Habits," "Air," "Food." Could be used as 14 daily "boxes" in a newspaper. Could we cut the title to read: "How to Live Long?" *Free.*

"Scarlet Fever"—another of the miniature booklets issued by John Hancock Life Insurance Co., Boston. 8 pp. Tells what most needs to be known—and about all that most people are willing to learn. *Free.*

"We Used to Think—Wrongly: We Know Now—For Certain"—Brooklyn Tuberculosis and Health Assn., 293 Schermerhorn St. 4-page folder—rough finish paper—inside pages contrast old ideas with current knowledge. *Free.*

"Whooping Cough"—"Measles"—"Scarlet Fever"—"The Family Teeth"—"Diphtheria Costs! Prevention Pays!"—5 4-page folders on good quality rough finish paper—each different color—source indicated in small type on last page: "Tennessee State Dept. of Public Health—Nashville, Tenn.—1930." *Samples free.*

TIMELY

Some of the material listed below will be too late for use this season, but now is the time to secure copies for use next year.

"What Health Officers Do"—*Bulletin*, Indiana Board of Health. Oct., 1930.

"Nineteen Thirty the Best Health Year"—*Statistical Bulletin*, Metro-

politan Life Insurance Co. Jan., 1931.

"The Hollywood 18 Day Diet"—*Hygeia*. Mar., 1931. What is wrong with it—and why.

"Scarlet Fever and Measles." Radio talk. New York City Dept. of Health. *Free.*

"Improved Drinking Facilities in Places of Employment"—*Municipal Sanitation*, 24 W. 40th St., New York, N. Y. Feb., 1931. 25 cents.

Unemployment: "Hard Times and Health"—*The American Public Health News*; "Economizing Wisely"—Connecticut Dept. of Health; "Keep Up A Clean Front"—*Cleanliness Journal*, Cleanliness Institute, 45 E. 17th St., New York, N. Y. *Free.* "How baths and fresh collars help when jobs are scarce."

Carbon-monoxide poisoning: *Pittsburgh's Health*, Dept. of Health; Connecticut Dept. of Health (press); *The Foreman*, Employers' Mutual Liability Ins. Co., Wausau, Wis. (good 4-line analysis). *Free.*

Colds: Iowa Dept. of Health (press release); Illinois Dept. of Health (radio talk); Connecticut Dept. of Health—also "Effective Temperature" (press); New York State Dept. of Health (radio); Detroit Dept. of Health (press); Oregon Board of Health—fresh air (press); *Chicago's Health*, Chicago Health Dept.; New York City Dept. of Health (press); "The Billion Dollar Loss From Colds," *Hygeia*. Feb., 1931.

Pneumonia: Detroit Dept. of Health (press); U. S. Public Health Service (radio).

"How to Keep Warm in Winter" (the house, moisture, warmth in bed, etc.—much neglected topics), Rochester Bureau of Health (monthly bulletin).

MOTION PICTURES

"Test for Titles," by A. L. Gale. *Movie Makers*, 105 West 40th St., New York, N. Y. Feb., 1931. 25 cents.

"What to do and not to do when you

are writing titles." *Very practical and helpful.*

A carbon monoxide picture has been made by the Bureau of Mines in co-operation with an automobile company. Where c.m. develops and how to avoid its perils. *For transportation charges.* U. S. Bureau of Mines, Pittsburgh, Pa.

"The Hit That Scored," said by a number of safety people to be the best one-reel public safety film they have ever seen, has been produced by the Bell Telephone Company of Pennsylvania.

The film shows in an unusually interesting and realistic fashion some of the adventures of a good natured but reckless truck driver who believes in bluffing the other fellow—until an accident that almost causes the death of a little girl teaches him the lesson of safe driving.

The film has been found to be very effective without being in the least gruesome, according to those who have viewed it.

Apply to National Safety Council, 20 N. Wacker Drive, Chicago, Ill., or Citizens' Safety Committee, Philadelphia Chamber of Commerce.

Movie Makers (Feb., 1931) reports on two amateur pictures which illustrate two different possibilities:

To serve in the membership drive of the Crippled Children's Clinic, Birmingham, Ala., which organization provides free of charge orthopedic attention to children unable to pay. The Long Journey, 1,600 feet, 35 mm., produced by Jack London, has recently been completed. Making of the film required between ten and eleven months, it being necessary to film the children on their entry to the Clinic and again several months later when they were on the road to recovery.

Showing of the film to the Shriners' Club alone resulted in over \$900 in memberships for the Clinic, Mr. London reports. Since the cost of producing the film was in the neighborhood of only \$246, the actual cost of material, Mr. London having contributed his services as cameraman, the value of an amateur production in fund raising is again forcibly demonstrated.

An Auto Biography, the one reel 16 mm. film on accident prevention produced by Jack Lewis, Wichita, Kansas, is now being used in the intermediate schools of Wichita in con-

junction with a talk by a traffic officer. Several of the schools have booked the film for a second showing to follow two weeks after the first. The film has also been shown at Chamber of Commerce and Lions Club meetings and has, at the request of the street car company, been projected for their employees.

ADVERTISING

One easy step every health worker can take to help combat fake or extravagant advertising is to send copies to the National Better Business Bureau, Chrysler Bldg., New York, N. Y. If your newspaper editor is cooperative you might urge him to check doubtful advertising by writing to the above address.

Whatever you do—and it is reported to the editor—we will give you credit in the "Advertising" section of Education-Publicity Headquarters at Montreal.

Advertising & Selling, New York, N. Y., gives a full page to an advertisement quoting the Health Officer of Poultney, Vt., congratulating the American Cigar Co. for "fighting the Spitting Evil"—along with a letter to the editor in which the Health Officer explains that

I had no idea that it was to be used for advertising purposes, but understood that it was merely for my opinion on spit tipping and spitting in general.

The Health Officer now agrees that it is unwise to write a letter of commendation "without giving it due consideration."

NEWSPAPERS

"The biggest newspaper story that could break today" was suggested to *Editor and Publisher* by leading newspaper editors. Three or four suggested that it would be the "announcement of an absolute and indisputable cure for cancer."

David Lawrence, editor of *United States Daily*, addressed the annual meeting of American Social Hygiene

Assn. upon "The Function of the Press in Social Hygiene Education." He stressed the need of skillful preparation of material for the press.

Although health workers have been emphasizing the unwillingness of newspapers to mention the names of the venereal diseases, at least one city health department follows the same policy in its annual report. "Social Diseases" is as far as that health officer will go.

For about 12 years, every week, "Our Babies," a newspaper column on the care of babies, has been issued by Royal New Zealand Society for the Health of Women and Children, Dunedin, New Zealand.

Letters to editors and citizens are being sent out by Tennessee Tuberculosis Assn. in opposition to an effort to reduce the appropriation for the State Dept. of Health.

NEW

Eugenics, American Eugenics Society, New Haven, Conn., has become *People*. "A popular magazine of human biology and the manner in which it may be manipulated to achieve the improvement of the race."

EXHIBITS

Now is the time to start preparations for state and county fairs.

Numerous suggestions as to planning and making exhibits will be found in this department of the *Journal* running back several years.

A memorandum of several pages on fair exhibits will be sent upon request to the editor.

Last summer the Illinois State Dept. of Health demonstrated a homemade milk pasteurizing outfit which need cost less than \$5.00. Ask Illinois for details.

Connecticut State Department reports that weighing of the children is one of the interesting features of the

health exhibit of the State Department of Health. It gives the staff in attendance an opportunity to discuss health with the parents and incidentally it is found that parents themselves are the chief offenders in breaking health laws.

Thousands are attracted to the health exhibit at the fairs. There is a continuous showing of health films and many hours during the day the health tent is taxed to the utmost. At a fair which extended into the evening hours the films program had to be frequently interrupted to clear the tent and provide fresh air and ventilation, the pictures proved to be so popular.

Advice given by *Red Cross Courier* seems to apply to displays by other organizations:

Simplicity in conception for an exhibit or a float is its own reward. Our own people know that to concentrate attention upon one or two objectives serves to retain them in the mind. Perhaps, because of the multiple services rendered by the Red Cross, our exhibits and floats have been somewhat complicated. That is natural, for every one wants to tell a story in all its detail. However, telling a story and presenting it as a picture are very far apart—for the picture, to be effective, must have a central theme, a high light of the important element of the composition. In other words, in an exhibit or a float the mental processes are animated by the striking thing. The eyes focus on one point and see that one thing. Consequently to do the best to visualize Red Cross to the spectator, it is well to remember that simplicity and concentration upon the central picture are always advisable.

"How can I cultivate in my children a zest for food?" might be the theme of an exhibit. "That Zest for Food," by Rachel Ash (*Hygeia*, Oct., 1930), includes some of the possibilities for exhibit use.

The Community Health Association was represented in a big Boston parade by

A delegation of nurses who marched, led by one dressed as the first district nurse in Boston, of 1886. A striking sign carried by boy

scouts explained it all in a few words. The entire group attracted much attention and favorable comment.

"The International Exhibition of Hygiene, Dresden, Germany," by S. A. Cosgrove, M.D. *Public Health News*, New Jersey Dept. of Health. Dec., 1930. An excellent outline of the displays. *Free*.

"Overworked Spot Maps," by E. J. Reeder. *Public Safety*, Natl. Safety Council, 20 N. Wacker Drive, Chicago. Mar., 1931. Illustrates spot maps for automobile accidents; their value; what to use and not to use. Also, "Outdoor Displays," by L. W. McIntyre. How Pittsburgh is using startling three-dimension exhibits in open spaces. *Free*.

The New York City Cancer Committee, 34 East 75th St., has devised an unusual traveling exhibit. A group of 6 boxes provide a series of stages in which miniature scenes are displayed. The boxes make for easy transportation about the city. They are built up in pyramid fashion—on a table, or in a window on a low platform. Characters and backgrounds are cut outs, lacquered in colors. Each is removable so that new material may be inserted in the boxes. The boxes are in black lacquer with monel metal binding strips. Designing and executing the exhibit cost \$1,000, with \$600 for boxes and lighting. Designed by F. J. Rigney. As is so often the case the use of all capital letters for the captions makes reading difficult—especially with hand lettering. The unlighted captions suffer in contrast with the well-lighted scenes. Borrow a photograph of the exhibit to understand it fully.

"Just one thing at a time" is urged by Edith M. Ross in *Survey*:

Are most of us eye- or ear-minded? Do

we notice more, do we remember better, what we see or what we hear? From my own experience, first as a county nurse, then in state work, I find that people remember better what I say if they can see at the same time something allied to the subject of my talk. Charts, especially in speaking to adults, always help. Tack maps are nearly always fascinating. There is something concrete, vital about them—something that takes away the intangibility of mere figures and brings facts home to us. Our public is far more hungry for information than we imagine. But we must be careful not to repel it by trying to feed it dull, dry, lifeless facts.

The staff nurses of the Minnesota Public Health Association, when they make school inspections, use a small cloth dog or monkey or a "Felix" cat to arouse the interest of the younger children. Into any of these, which consist of a head and forelegs, we run the fingers of one hand. Then we get the children to ask it questions such as: "How many glasses of milk do you drink?" or "What time do you go to bed?" And the dog or cat or monkey, as the case may be, waves one paw slowly to indicate the number of glasses of milk he consumes or the hour at which he retires. He shows them, too, how he washes behind his ears, how he brushes his teeth. There are few health habits which these toy animals cannot help us expound. And when I return the following year, I find that what Coco, my monkey, or Milko, my dog, has told them has not been forgotten.

What and What of It?—What you are doing in broadcasting health material, and whatever evidence you have that audiences are listening in will be of great interest in a session at the National Conference of Social Work in June.

Please send copies of any typewritten or printed reports, with supplementary information. Especially wanted: *do you do anything beyond straight talks?* Please send now to editor of this department.

All of this material, and more, will be shown also at Montreal in September.

BOOKS AND REPORTS

Insects, Ticks, Mites and Venomous Animals of Medical and Veterinary Importance. Part II—Public Health—*By Walter Scott Patton, M.B., Ch.B., F.E.S. Dept. of Entomology, School of Tropical Medicine, Liverpool, England, 1931. 740 pp. Price, \$6.00.*

This volume is Part II of the series treating of the pests mentioned in the title, Part I being devoted to the medical, while this deals with the public health standpoint. The arrangement is in general the same, the successive chapters being arranged for the sessions of classes working for the diploma in public health, the whole course consisting of 9 meetings of 2 hours each.

During the first part of the meetings, brief explanations of the zoölogical nomenclature, classification, etc., are given, followed by laboratory work in which typical examples of the orders of insects discussed are exhibited. Short summaries of the material covered at each meeting are given, and a revision of the whole ends the part of the volume devoted to the course.

Two appendixes follow, the first of which describes the dissection of the alimentary tract and salivary glands of the mosquito, while the second, 340 pages in length, is devoted to the household arthropods and their control. This ends with lists of those which are destructive to household belongings, such as books, leather, carpets, tapestries, blankets, furniture, and woodwork; foodstuffs, such as stored grains and their products, spices, coffee, cacao beans, dried and fresh fruits, cheeses, cured and fresh meats, drugs, museum collections, etc. A section is given to those curious insects which damage lead.

There are innumerable illustrations and 57 plates, a number of which are in colors, and all of which are exquisitely done.

Our growing knowledge of the important part played by insects in the spread of disease and of their menace to our comfort as well as our food supplies gives this book an added value. No review can do full justice to it. It must be seen and studied.

The frontispiece is a photograph of Dr. Leland O. Howard, for many years Chief of the Bureau of Entomology of the U. S. Department of Agriculture, who is termed the "Father of Public Health Entomology." The legend pays him a well deserved tribute which will be appreciated by all Americans. Bound on the inside of the back cover is a chart giving the classification of arthropods of public health importance.

The printing and make-up of the book are excellent, and there are two good indexes, one to the part of the book devoted to the course and Appendix I, and the other to Appendix II. While designed for teaching purposes, this series contains an enormous amount of information which will be found most useful to physicians and public health workers. Appendix II will appeal to a wide range of students as well as to the general public. The price of the book is remarkably low. M. P. RAVENEL

Cancer and Scientific Research—*By Barbara Holmes, Ph.D. London: Sheldon Press, 1931. 160 pp. Price, \$1.50.*

Cancer is generally conceded to be one of the most serious of all public health problems. Despite the intensive educational efforts at cancer control

which have been directed at the laity, malignant diseases as a whole have not been diminished. Instead, there has been, in the opinion of many competent observers, a persistent increase in neoplastic diseases, although this now seems to be slowing down.

The wider the established knowledge about cancer, the better. Authoritative books of a popular nature on this subject are, however, unfortunately, rare. This little book is a worthwhile contribution to cancer literature because it presents an able digest and interpretation of a vast amount of experimental research of a highly technical nature.

Sanitarians who desire to add to their conception of the cancer problem will find this book of value. The style is pleasing and it is written, in general, with true scientific restraint, although some biologists may not agree wholly with the conclusions regarding the inheritance of cancer, which are based chiefly on the disputed work of Maude Slye. The highly intelligent lay reader will also find the book of interest, for as Sir F. Gowland Hopkins writes in a brief preface, "It is striking, indeed, to find how much enlightenment is given in so small a book."

JAMES A. TOBEY

Laboratory Diagnosis—By Edwin E. Osgood, M.A., M.D., and Howard D. Haskins, M.D. Philadelphia: Blakiston, 1931. 475 pp. Price, \$5.00.

As stated in the preface, the object of this book is "to teach the habits of thinking that are necessary to obtain the fullest information from laboratory sources." The authors are professors in the University of Oregon Medical School and the book is the outgrowth of their experiences in teaching and in the laboratories of the hospitals connected with the university.

The book is divided into two parts. Part one is primarily of interest to the practitioner and considers the knowl-

edge which he must have available at the bedside of the patient. At the beginning of each chapter a brief résumé is given of the essential anatomy, physiology, biochemistry and pathology and at the close of each, very useful tables of summaries and limits of laboratory findings to be expected in normal and pathological conditions are found. A special "index by diseases" of this part should be very useful.

The second part of the book is devoted to the details of laboratory procedures involved in the different methods recommended in Part I. Two short chapters are given to the Calibration of Apparatus and the Preparation of Standard Solutions.

The treatment of bacteriology and serology is admittedly very incomplete, consultation of textbooks on these subjects being recommended. In every case the methods which the authors prefer are emphasized and in many cases are the only ones given. The omission of all methods using Nessler's solution is striking.

Throughout there are generous footnote references to the original literature. Many useful tables which aid in calculation are given and the 6 colored plates in the chapter on Hematology are especially well done. The book is very well printed on good paper and is free from typographical errors. The unusual treatment of the material given, especially in Part I, should make the book interesting and useful both to the practicing physician and the laboratory worker.

A. B. HAW

Safety Education—Idabelle Stevenson. New York: A. S. Barnes & Co., 1931. Price, \$1.00.

There are several excellent books on safety and accident prevention, but this little volume by the Executive Secretary of the Education Division of the National Safety Council stands quite unique as representing the essentials of

Safety Education. It is evidently written by an expert who is offering to the "teacher-leader a program full of wholesome procedures that bring the full force of safety into the life of the individual pupil, the school group, and the community."

Ten short, tersely written chapters cover the problem, general methods of teaching safety, student safety organization, safety patrols, accident reporting and inspection, publicity, assembly programs, special projects, safety in the athletic program, and essential information in regard to street safety, safety in sports and recreations, and in the home.

Safety data, charts, axioms, "what-to-do's," and "how-to-do-it," and a list of junior safety councils, manufacturers of badges, etc., and a selected bibliography accompany. Safety consists in the correct way of doing things, but first there must be a correct way of thinking, which means proper training in childhood. Incidentally, the data show that accidents among children are decreasing while those among adults are decidedly increasing. Credit for this may justly go to the current child safety program. Teachers, parents and others will find this book of paramount value.

EMERY R. HAYHURST

What We Drink—By Various Authors, with Introduction by Sir James Crichton-Browne. Edited by Hugh Wansey Bayly. Issued under the Authority of The Scientific Committee of the True Temperance Association. London: William Heinemann, 1930. Price, \$.40.

Evidently written for lay people, this book will disappoint those who look for something more exact or extensive. The information is correct as far as it goes. Inasmuch as the great use of soft drinks is peculiarly American, this chapter particularly will fail to satisfy American readers. There is scant mention, for example, of the large number

of soft drinks in this country, which are all classed as "Coca-kola," which contain caffeine, but some five pages are given to a discussion of the English "public house system" in which foods as well as drinks are sold. In general, however, it will aid the public in the proper selection and control of beverages, and be an aid to temperance.

M. P. RAVENEL

Food Poisoning and Food-Borne Infection—By Edwin Oakes Jordan. Chicago: University of Chicago Press, 1931. 286 pp. Price, \$2.50.

This book, belonging to the University of Chicago Science Series, supplants *Food Poisoning* by the same author, issued in 1917. Since that time, poisoning by foods has been intensively studied, particularly in England and America. The packers themselves were among the first to recognize the necessity of this, and have appropriated liberally for investigations carried on at the Universities of California, Chicago, Harvard, and Stanford. The author played an active part in some of the most important of these, and is peculiarly well fitted to write on the subject. He has put the sum of available knowledge into a small space, but has covered the necessary points in satisfactory fashion.

We consider the section on Spoiled and Decomposed Foods, short as it is, of more than usual interest, perhaps because it discusses matters which are not so often considered as the well known and too often occurring acute outbreaks. Certainly this matter needs further study. In view of the "imperfect and unsatisfactory" state of our knowledge, we commend the opinion expressed that we must continue our methods of protection.

The printing and make-up of the book are good, the illustrations fairly so. Good indexes of authors and subjects end the volume.

M. P. RAVENEL

Lateral Curvature of the Spine and Round Shoulders—By *Robert W. Lovett, M.D.* (5th ed.) Revised and edited by *Frank E. Ober and A. H. Brewster*. Philadelphia: Blakiston, 1931. 240 pp. Price, \$3.50.

The fifth edition of Lovett's *Lateral Curvature of the Spine and Round Shoulders* adds to this classical treatise the results of modern experience. The 24 years that have elapsed since the first edition have produced nothing to controvert the admirable research of Dr. Lovett, upon which have been based the principles of treatment since that time. It is along lines of treatment itself that changes and additions to the original edition have been found necessary. Both the new material and the reorganization of the old render the present edition of vastly greater value to the practitioner.

The revamping of the section on exercises has been particularly successful, and the clarity of both pictures and text renders that part of the work of inestimable value. This may also be said of the chapters on supporting and corrective devices. The ingenuity and effectiveness of the turnbuckle jacket are strikingly brought out both in the photographs and roentgenograms.

By no means the least of its values is the brevity and compactness of the book. Aside from its scientific worth, it is indispensable as a working manual for every orthopedist, and will be a most useful guide to those interested in the preventive aspects of child culture.

KENDALL EMERSON

Determination of the Interrelations, Partial and Multiple, Between Various Anthropometric Measurements of College Women—By *Mary Louise Boillin*. Teachers College, Columbia University: Bureau of Publications, 1930. 63 pp. Price, \$1.50.

A study of college women is described

wherein data are collected from which the correlations of body weight with various anthropometric magnitudes are obtained. The questionable assumption that body weight, properly chosen, is a fundamental index to health even at maturity seems to underlie the point of view. Height is not as reliable in determining weight expectancy as has been believed, other skeletal dimensions having more value. In late adolescence, weight may have some real diagnostic value in determining the degree of health.

ALLEN E. STEARN

Facts and Figures About Tuberculosis—Compiled by *Jessamine S. Whitney*. New York: New York Tuberculosis and Health Association, Inc., 1931. 63 pp. Paper. Price, \$.75.

Miss Whitney's monograph, *Facts and Figures About Tuberculosis*, will fill a real want.

To student and teacher in need of up-to-date facts on the important aspects of tuberculosis, it will be invaluable. Concisely and clearly, Miss Whitney has delved into and makes available here measured knowledge of the mortality rates from tuberculosis in the entire United States for a whole generation; the differences by sex and by color in different sections; the mortality percentage in important occupational groups; figures of geographical distribution; relation to other important causes of death; nationality rates, comparative death rates in various parts of the world; data on institutional facilities, clinic, sanatorium and nursing. Particularly informative also is the unusual chapter on tuberculous infection and the percentages of reaction found by various investigators in different communities.

In the United States, next to widespread general education, it has been well remarked that public health progress has been the most distinctive achievement of the American democ-

racy; and the measures for the control of tuberculosis have been one of the leading parts in this. To the social student, Miss Whitney's measured statements on the prevalence and gradual diminution of tuberculosis in the United States offer a rare mine of contemporaneous historical facts to be studied readily here. To the public or private health official charged or connected with tuberculosis responsibilities, the information should be most helpful in organizing his work more understandingly.

G. J. DROLET

Health Field in Social Work, From "Proceedings of the National Conference of Social Work," 1930.

One seldom picks up a volume of convention proceedings whose table of contents offers so many names of national prominence and authority in as many fields as the volume made up of selected papers presented at the 1930 Conference of Social Work in Boston. In the presidential address of Dr. Miriam Van Waters one reviews the six decades of progress since 1874 when the first "Proceedings" was published and he finds that "we do not solve our problems by the techniques we evolve; we merely outlive them"; that the same problems confront the worker today as in 1874, but that the decades have brought a philosophy of understanding life which gives to those who practise it the ability to face life realistically, as it is, and as it may be, without dogma or fear.

George W. Wickersham's very enlightening address on law enforcement urges education and persuasion in law observance to supply what the authority of church and home now fails to provide.

Several outstanding papers from the health section are included. The first of these, "The Chronic Disease Problem in Massachusetts," by Dr. Herbert L. Lombard outlines very extensive studies

in the control of chronic disease in the middle-aged. The five variables which have significance in the problem are age, sex, economic status, density of population, and nationality. Additional data are being collected in regard to life habits to determine importance of such factors as diet, emotions, rest and relaxation, and environment.

Since the Massachusetts Department of Health has developed one of the most extensive state-wide programs for cancer, Dr. G. H. Bigelow's paper, "The Massachusetts Cancer Program," is of utmost significance and interest. Dr. C.-E. A. Winslow's very interesting paper on "The Health Survey as a Social Instrument" gives a practical and conservative discussion of the value of the health survey as an instrument of measurement and standardization, but with the warning that while a mathematical formula applies to all cases in its entirety, a form of social organization does not; so that a successful survey must recognize community characteristics and combine outside expert knowledge with local experience.

Wesley C. Mitchell's paper, "The Economic Basis for Social Progress," brings out the significant fact that the average earnings of \$1,205 or \$1,304 should no longer be compared with the minimum family budget of \$2,057 or \$2,100, for the average family has 1.8 gainful workers including young and old people. HOWARD WHIPPLE GREEN

Dental Health—By George A. Swendiman. Boston: Stratford Co., 1930. 121 pp. Price, \$3.00.

Chapter I on habits is good advice for the layman. We cannot agree with all the ideas expressed in Chapter II on the temporary teeth. Experience and research are changing some of the old accepted viewpoints expressed by the author.

Chapter IV presents clearly a true statement regarding the cleaning of

teeth which should be understood by all laymen. Chapter V presents the focal infection idea in the light of the most recent researches, which is the best viewpoint the profession has today. It seems most improbable that we will change the viewpoint that non-vital teeth are always a menace to their host.

Chapter VI on pyorrhea is a sane statement with good advice for the layman. Chapter VII on oral hygiene presents some questionable methods but it is hard for men to agree about something that is not based on true research. We doubt whether the method of brushing the teeth makes very much difference just so we keep the teeth reasonably clean.

Chapter VIII gives the layman many true and valuable points about dentistry that should help him to select the type of service he desires. Chapter IX presents good points on the social side of dental health but we fear the writer has not really met the social problems in any large way. His attitude is good, but his experience with the problems of social dental needs appears limited.

On the whole, the book is good. It is well written, clear and simple in explanation, that is, it is as simple as it is possible to make a highly technical subject.

The book covers the field in a way not covered by any other book with which I am acquainted.

It can be honestly recommended as an excellent book for the layman.

HARRIS R. C. WILSON

Civilization and the Cripple—By Frederick Watson. Bale, Sons & Daniellson, Ltd., 1930. International Society for Crippled Children, Inc., Elyria, O. Price 10/6 net, \$2.50.

This is an excellent presentation of the cripple and his relation to society. Included under the term "cripple" are all industrial and other accidents as well as conditions resulting from disease and

congenital defects in adults and children.

Mr. Watson speaks from a long familiarity with his subject. He founded and has edited for more than five years the international quarterly journal *The Cripple*. He has also had experience in organization as county director of the British Red Cross Society and chairman of the Montgomeryshire Voluntary Orthopedic Association, and experience in rehabilitation as deputy controller in the Appointments Department of the Ministry of Labor during the demobilization period after the Armistice.

The book as a whole is extremely interesting. An historical review of the cripple from antiquity down to 1930 is given. It was not until the 18th century that experience and reason came into play. The first Factory Act in England was in 1802, though already the great English, French and German bone and joint surgeons had done notable work, and in America, Dr. John Ball (1789–1862) opened his hospital for cripples. John Little (1810–1894) was the first great apostle of orthopedic surgery in England. The great influence of the war, the rapid development of orthopedics as a speciality, and the focusing of attention on the crippling conditions in soldiers, are well discussed.

It is interesting to note the progress which has been made in this country and the emphasis placed on it by Mr. Watson in the chapter entitled "The American Scheme." The chapter on "Prevention and Rehabilitation" is forcefully written and contains many excellent suggestions for the solution of the problem. The book is well written and presented in a most orderly fashion, and is of vital interest to any one associated or interested in the problem of "The Cripple."

The printing, illustrations and make-up are excellent. The book can be recommended without reserve.

G. KENNETH COONSE

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Manchester, N. H.—The 1930 printed report of this city of 76,834 population records a death rate of 11.0, a birth rate of 16.9, an infant mortality rate of 67, and a tuberculosis death rate of 35. In the tuberculosis clinic there was an attendance of 798, 222 new patients being examined. A total of 1,561 home nursing visits was made by the clinic nurse.

In the administration of the school health program, the schools have been divided into 3 districts with a physician and 2 nurses assigned to each district. Children in the kindergarten, first, fourth, and eighth grades are examined annually. Children in the kindergarten and first two grades, whose parents so request in writing, are given toxin-antitoxin by the school physician. Weekly clinics for giving the treatment to preschool children and others who wish it are held at the office of the health department.

Newport, R. I.—This city, with a population of 27,430, including 1,926 persons of the U. S. Army and Navy, reports 456 births and 353 local deaths, and an infant mortality rate of 37.28. Four cases of diphtheria occurred with no deaths. Since 1923, 3,312 children have been immunized, including 47 per cent of the school population. The health department expenditures amounted to \$.86 per capita. According to the 1930 report, for 12 years there has been enforced an ordinance permitting the sale of only milk of pasteurized or certified grades.

Maryland—An analysis of 84 typhoid fever carriers listed in the office of the State Department of Health shows that 256 cases of the disease were traced to these sources. By occupation,

39 per cent were housewives, 11.9 per cent milk handlers, 9.5 per cent cooks, 2.4 per cent laborers, 7.1 per cent farmers, 4.8 per cent shell fish handlers, 9.5 per cent school age children, and of 17.8 per cent occupation was not stated. By bacteriological examination, 48.7 per cent were found to be stool carriers, 9.5 per cent urine carriers, 15.5 per cent stool and urine carriers, 26.3 per cent not stated. A definite history of previous typhoid or paratyphoid was stated in 69 per cent of the carriers.

During the year the Bureau of Child Hygiene conducted 420 conferences at which 6,791 children were examined and referred to their physicians. Prenatal conferences were continued. Ten orthopedic conferences were conducted in the counties by representatives of the League for Crippled Children in cooperation with the bureau. Courses in midwifery were offered in several counties, and only those midwives were licensed who attended these classes or had received corresponding instruction. An important survey of maternal deaths in the state was completed and preliminary figures are presented in the annual report. Negro health week was observed and a colored physician representing the bureau conducted child health conferences for negro children in several counties of the state.

Knoxville, Tenn.—The 1930 annual report, in mimeographed form, outlines the work carried on by the bureau of health and contains excellent tabular and graphic material of interest in illustrating the descriptive text. Certain low records were established, including infant mortality (70), typhoid (1.8), diphtheria (2.8) and tuberculosis (69). Expenditures amounted to \$104,941 in this city of 107,200 population

The work of the division of general sanitation is organized on a district basis, there being 6 districts. Of the total nuisances abated, it is noteworthy that 96 per cent were found by the inspectors on routine premise to premise inspection, while 4 per cent of the corrections resulted from complaints. There were 2,966 sanitary sewer connections effected during the year. Milk control is exercised in accordance with the standard milk ordinance of the U. S. Public Health Service.

Orange County, Calif.—This county of 800 square miles, with a 1930 population of 118,611, even distribution of population, and good roads, is well adapted to the county unit plan of health administration. According to the annual report, 12 incorporated cities have contracted with the county health department for central health administration. The largest city, Santa Ana, has a population of 30,332 and is centrally located. The recording of vital statistics was transferred to the health department during the year. Another advance step was the completion of arrangements in two communities whereby the school districts and the county shared the expenses of the public health nurses, so that in each of these localities the one health worker carried on a generalized program.

During 1930, 2,130 individuals were given 3 immunizing doses against diphtheria. There were 164 cases and 3 deaths from this disease. There were 2,375 smallpox vaccinations performed.

The health promotion program for the infant and preschool child takes the form of mothers' educational centers, 358 conferences having been held during 9 months of 1930, with an attendance of 4,572, 562 visits being made by Mexicans. Home visits in the interest of child hygiene numbered 1,123. A weekly bulletin is sent by the health department to all physicians and health

workers in the county, stating the presence of communicable disease and containing suggestions regarding health work. The year's budget amounted to \$66,727.

Palama Settlement—Palama Settlement is a health and welfare center in Honolulu where a fourfold program of medical, dental, nursing and recreation services is provided. This is the chief voluntary health organization in the city. The 1930 annual report is one of the most attractive and comprehensive reports of the year.

More than 12,000 families received care last year, and through the recreation department some 10,000 individuals were helped toward better citizenship. In the field of public health nursing, a generalized city service has been developed through a pooling of the nurses of Palama and of the Board of Health. An average of 115 poor sick patients are seen daily by the medical staff. Preventive dental treatment provided for 4,133 first and second grade school children last year. Thirteen well baby and preschool conferences were regularly held. Two health building summer camps for undernourished boys and girls were maintained. Health education was highly developed through talks, radio, motion pictures, exhibits, articles, and activities to advance the health knowledge of the community. Boys were taught leadership and responsibility in clubs and through athletics. Girls were taught home-making, swimming, dancing, camping, and participated in athletics. Staff members served on 18 major health and welfare committees of the city. Expenditures amounted to \$194,503.

During the year, the nurses assisted in immunizing 7,753 preschool and 331 school children against diphtheria, and in the health examination and vaccination of 5,510 preschool children. There were 962 medical examinations of foot-

ball and basketball players. Exclusive of 1,712 prenatal clinic visits, there were 35,919 visits to the medical department by individuals representing over 13 racial groups, the Japanese, Porto Rican, Portuguese, Korean, Hawaiian, and Filipino races predominating. X-ray examinations numbered 2,138. Over 50 per cent of the preschool children in the city have been protected from diphtheria by immunization and over 65 per cent have received health examinations.

San Jose, Calif.—The 1930 report indicates for this city of 57,651 population a birth rate of 14.1, a death rate of 10.8 and an infant mortality rate of 45.7. Of the 588 births, 72.6 per cent

occurred in hospitals. Excellent graphs illustrate the statistical report. There were 515 children immunized by the health department with toxoid and 533 vaccinated against smallpox. Two new milk pasteurizing plants were built during the year, making a total of 9 in operation in the city.

Activities in popular health instruction include monthly bulletins to the city council, press, physicians, schools, and health workers, besides an annual report and in addition to the use of various health pamphlets furnished by insurance companies.

The attractiveness of the report is increased by the use of several photographs.

BOOKS RECEIVED

INSECTS, TICKS, MITES AND VENOMOUS ANIMALS OF MEDICAL AND VETERINARY IMPORTANCE. Part 2. By W. S. Patton. Liverpool: School of Tropical Medicine, 1930. 740 pp. Price, \$6.00.

PROTOZOAN PARASITISM OF THE ALIMENTARY TRACT. By Kenneth M. Lynch. New York: Macmillan, 1930. 258 pp. Price, \$3.75.

THE CRIMINAL, THE JUDGE, AND THE PUBLIC. By Franz Alexander. New York: Macmillan, 1931. 238 pp. Price, \$2.50.

AMERICAN STANDARDS AND PLANES OF LIVING. By Thomas D. Eliot. Boston: Ginn, 1931. 931 pp. Price, \$5.00.

HEALTH AT THE GATEWAY. Problems and International Obligations of a Seaport City. By E. W. Hope. New York: Macmillan, 1931. 213 pp. Price, \$5.00.

MEDICAL ADMINISTRATION OF TEACHING HOSPITALS. By Emmet B. Bay. Chicago: University of Chicago Press, 1931. 136 pp. Price, \$2.00.

NINETEENTH ANNUAL REPORT OF THE INTERNATIONAL ASSOCIATION OF DAIRY AND MILK INSPECTORS. Compiled by Paul B. Brooks. Albany: State Department of Health, 1931. 300 pp. Price, \$2.00.

MANUAL OF TUBERCULOSIS FOR NURSES. By E. Ashworth Underwood. New York: Wood, 1931. 272 pp. Price, \$2.50.

PRACTICAL DIETETICS IN HEALTH AND DISEASE.

By Sanford Blum. 4th ed. Philadelphia: Davis, 1931. 380 pp. Price, \$4.00.

CLINICAL PSYCHIATRY. 3d ed. By Edward A. Strecker and Franklin G. Ebaugh. Philadelphia: Blakiston, 1931. 553 pp. Price, \$4.00.

NOGUCHI. By Gustav Eckstein. New York: Harper, 1931. 418 pp. Price, \$5.00.

THE INTERNATIONAL MEDICAL ANNUAL, 1931. Edited by Carey F. Coombs, M.D., and A. Rendle Short, M.D. New York: Wood, 1931. 551 pp. Price, \$6.00.

PRACTICAL HYGIENE SERIES. By Francis M. Walters. Book I. Our Journey of Growth. 251 pp. Price, \$.80. Book II. Our Health Foundations. 276 pp. Price, \$.88. New York: Heath, 1931.

HOW TO MAKE CITIES CLEANER AND HEALTHIER. Published by the American District Steam Company, North Tona-wanda, New York. 1931. 15 pp.

HEALTH ON THE FARM AND IN THE VILLAGE. By C.-E. A. Winslow. New York: Macmillan, 1931. 281 pp. Price, \$1.00.

INTERNATIONAL STUDIES ON THE RELATION BETWEEN THE PRIVATE PRACTICE OF MEDICINE, WITH SPECIAL REFERENCE TO THE PREVENTION OF DISEASE. Conducted for the Milbank Memorial Fund by Sir Arthur Newsholme. Vol. I. Baltimore: Williams & Wilkins, 1931. 248 pp. Price,

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON. PH. D.

Milk Supply Committee Report—The nutritional values of milk, the need for safe milk, the importance of uniform standards of law enforcement, and the possibilities of propaganda are all set forth *in extenso* in this inclusive subcommittee report of the White House Conference.

ANON. Preliminary Report of Committee on Milk Production and Control. Pub. Health Rep., 46, 14: 769 (Apr. 3), 1931.

Classification of Meningococci—An extensive study of 235 strains of meningococci reveals that most can be assigned to the four types of the Gordon-Murray classification. Although small outbreaks are often due to one type, extensive epidemics may involve all varieties.

BRANTHAM, S. E., *et al.* Studies on Meningococci Isolated in the United States, 1928-1930. Pub. Health Rep., 46, 16: 897 (Apr. 17), 1931.

Health Examination Propaganda—How to make a talk on health examinations. What to say and how to say it. Excellent source material. Should be in every health department file.

CRAMPTON, C. W. Addressing Lay Organizations on the Health Examination. New York State J. Med., 31, 8: 463 (Apr. 15), 1931.

Rural Health Progress—Reviewing the growth of county health units over the 19-year period since the first one was established, the importance of an adequate personnel is stressed.

FOARD, F. T. The County Health Unit of Yesterday and Today. Pub. Health Rep., 46, 17: 957 (Apr. 24), 1931.

Excessive Irradiation and Nutrition—Rats subjected to excessive ultra-

violet irradiation and given large doses of viosterol grew as well as control animals and showed no difference at necropsy.

HESS, A. F., and SMITH, P. E. Excessive Ultra-violet Irradiation. Am. J. Dis. Child., 41, 4: 775 (Apr.), 1931.

Tuberculosis Nursing Care—Nearly half the families visited by Cleveland Health Department nurses presented a tuberculosis problem. The results of these nursing visits are presented statistically.

HISCOCK, I. V., and TEMPLETON, C. M. Nursing Supervision of Post-Sanatorium Cases. Pub. Health Nurse, 23, 4: 177 (Apr.), 1931.

Personal Hygiene Applied—All the worthwhile information contained in the modern textbook on personal hygiene condensed to a dozen pages for the benefit of the intelligent seeker after health information.

LAKEMAN, M. R., and BALDWIN, E. V. Successful Living. The Commonhealth, 18, 1: 39 (Jan.-Mar.), 1931.

Iron Miners' Pneumoconiosis—Operators of air drills often develop lung fibrosis several years after they have quit work even though no symptoms were evident at the time.

LAWSON, G. B., *et al.* Pneumoconiosis in Iron Miners. J. A. M. A., 96, 14: 1129 (Apr. 4), 1931.

Germicidal Activity Tests—To the regular phenol coefficient test the addition of one called the growth-resistant (G-R) test is applied to indicate the true value of silver protein preparations.

LEONARD, G. F. Limitations of Phenol Coefficient Tests in Determining Germicidal Activities. J. Infect. Dis., 48, 4: 358 (Apr.), 1931.

Health Administrative Trends—Official health administrators need the active coöperation of unofficial health agencies, educational authorities and organized medicine: this is the gist of an excellent dissertation on sound and unsound trends in public health administration.

MCLAUGHLIN, A. J. Trends in Public Health Service. *Illinois Health Quart.*, 3, 1: 3 (Jan.-Mar.), 1931.

American Blood Pressure—Hypertension is a disease of American life; the remedies are different standards, more striving for contentment, less for riches, the seeds to be sown in childhood.

RIESMAN, D. High Blood Pressure and Longevity. *J. A. M. A.*, 96, 14: 1106 (Apr. 4), 1931.

Tuberculosis Work-Cure—A detailed description of a clinic in which surgical tuberculosis cases get heliotherapy and an opportunity to work.

ROLLER, A. The International Factory Clinic. *J. State Med.*, 39, 4: 219 (Apr.), 1931.

Poliomyelitis Epidemics—Five outbreaks in 8 years numbering 300 cases of local origin in Syracuse are the basis of an interesting epidemiologic study suggesting the spread of the disease by contact infection.

SILVERMAN, A. C. Acute Poliomyelitis in Syracuse, N. Y. *Am. J. Dis. Child.*, 41, 4: 829 (Apr.), 1931.

Benzene Hazards in Industry—The varying toxicities of a large group of benzene derivatives, as determined by effect upon experimental animals, are recorded in this consideration of their importance as industrial hazards.

SMYTH, H. F. The Toxicity of Certain Benzene Derivatives and Related Compounds. *J. Indust. Hyg.*, 13, 3: 87 (Mar.), 1931.

Overeating America—Four restraining influences will affect the growing national overweight: education in nutrition, medical precept, life insurance admonition, and style. And the greatest of these is style.

TAYLOR, A. E. The National Overweight. *Sci. Monthly* (May), 1931, p. 393.

Etiology of Scarlet Fever—Another demonstration of the possibility of producing typical scarlet fever experimentally by swabbing throats with culture of the scarlatinal streptococcus. This study was made in Manchuria.

TOYODA, T., *et al.* Experimental Production of Scarlet Fever by Means of a Scarlatinal Hemolytic Streptococcus. *J. Infect. Dis.*, 48, 4: 350 (Apr.), 1931.

Scarlet Fever Prophylaxis—Scarlatinal streptococcus toxin can be rendered less toxic by subjecting it to heat and formalin without altering its antigenic properties. The number of doses of the treated product can be reduced.

VELDEE, M. V. Antigenic Value of Scarlet Fever Streptococcus Toxin Modified by the Action of Formalin. *Pub. Health Rep.*, 46, 13: 693 (Mar. 27), 1931.

Decentralization of City Health Administration—Recounting the steps in the development of health districts in New York City as a means of perfecting a workable administrative scheme for a great municipality.

WYNNE, S. W. Neighborhood Health Development in the City of New York. *Milbank Quart. Bull.*, 9, 2: 37 (Apr.), 1931.

NEWS FROM THE FIELD

ENTOMOLOGY LABORATORY MOVES

THE U. S. Department of Agriculture, Bureau of Entomology, Division of Insects Relating to Man and Animals, has moved its laboratory, formerly conducted at Mound, La., under Dr. W. V. King, to Orlando, Fla., with G. H. Bradley in charge.

ADVISERS ARE NAMED FOR NUTRITION STUDY

TWO Educators Appointed to Aid Government Research—L. B. Mendel, professor of physiological chemistry at Yale University, and E. B. Hart, professor of agricultural chemistry at the University of Wisconsin, two internationally known authorities on protein, vitamins and nutrition, have accepted appointment by the Department of Agriculture as advisers to its Protein and Nutrition Division in the Bureau of Chemistry and Soils.

The department called upon these authorities for their advice and suggestions as to how its work on nutrition may be improved, and to assist the staff of the Protein and Nutrition Division in strengthening the important lines of work now under way.—*U. S. Daily*, Apr. 24, 1931.

DR. HARRIS

DR. LOUIS I. HARRIS has severed his connection with the National Dairy Products Corporation, and for the time being is devoting himself to writing. He stated that he expects to remain in retirement until he finds a type of consultation work in public health administration or other public health work which will be congenial.

Dr. Harris entered the Department of Health of the City of New York in 1907 as a civil service employee and continued in that service in a variety of capacities, organizing the Division of Industrial Hygiene in 1914 and directing its work until he became Director of the Bureau of Preventable Diseases in 1917. In 1926, Mayor Walker selected him from a list of public health workers nominated by the New York Academy of Medicine, and he served for nearly three years as Commissioner of Health of the City of New York.

He has been active in the affairs of the American Public Health Association. He served as Chairman of the Health Officers Section, as a member of the Governing Council, member of the Executive Board, and as First Vice-President of the Association in 1930. He was Chairman of the Committee on Cooperation, Development and Finance, which formulated the plans and policies which the Association is now following.

HOSPITAL CARE FOR MENTAL PATIENTS

THE National Committee for Mental Hygiene, Inc., of New York, sent questionnaires to some 600 hospitals, asking for information as to the existence of clinics and psychopathic wards or departments where examination or treatment might be given to mental patients.

Of the 421 hospitals that replied, 122 reported special facilities; 17 reported incidental services; and a total of 3,298 beds for mental patients was reported by 53 of the 56 hospitals that have special wards.

Of the 122 hospitals that reported special facilities for mental patients, 56

have special mental wards; 97 reported clinics; 31 reported both wards and clinics; 25 reported wards only; and 66 reported clinics only.

THE ARIZONA PUBLIC HEALTH ASSOCIATION MEETING

THE Arizona Public Health Association held its fourth annual meeting at Nogales May 5 and 6.

WESTINGHOUSE AWARD

DR. C. M. SLACK, Research Engineer of the Westinghouse Lamp Company, recently received the "Award for Outstanding Accomplishments" and the accompanying \$500 in cash for the development of a glass bubble to be used as a window in the Lenard Ray Tube. This award is given each year by the Westinghouse organization for the most important changes either in

manufacturing methods or the design of a product made by the company. Lenard Ray Tubes are used to produce high speed electrons or Lenard Rays outside the generating tube for experiments in the field of chemistry, biology, and luminescence.

SIGHT-SAVING CLASSES THIS SUMMER

FOUR universities will offer courses for the training of teachers and supervisors of sight-saving classes this summer. The courses will be as follows:

Tulane University, New Orleans, La.,
June 15 to July 24
University of Chicago, Chicago, Ill.,
June 22 to July 24
State Teachers College, Buffalo, N. Y.,
June 29 to August 7
Teachers College, Columbia University,
New York, July 6 to August 14

PERSONALS

FRANCIS E. FRONCZAK, M.D., F.A.P.H.A., attended the meeting, May 19 to 24, of the Royal Institute of Public Health in Frankfurt-am-Main, as an official representative of the A. P. H. A. In the same capacity he will attend the International Hospital Congress in Vienna and Budapest, June 8 to 14.

ALFRED F. HESS, M.D., pediatrician, member A. P. H. A., was elected one of the new members of the American Philosophical Society at its meeting in Philadelphia on April 24, 1931.

H. T. G. NAUMANN, City Chemist of Port Huron, Mich., member A. P. H. A. since 1917, died January 30, 1931.

JANE H. RIDER, State Sanitary Engineer, Tucson, Ariz., was recently elected an associate member of the American Society of Civil Engineers. This signal honor has been awarded

to only one other woman in the United States.

HENRY A. ROWLAND, for the past 16 years Secretary of the Department of Public Health of Toronto, Ont., Canada, and member A. P. H. A., has been appointed Superintendent of the Riverdale Isolation Hospital, at Toronto.

EDGAR B. KAY, of Washington, D. C., member A. P. H. A., former dean of the School of Engineering of the University of Alabama and former chief of the Hydraulic and Sanitary Division, Quartermaster's Office, U. S. A., died April 20, 1931.

DR. JOHN A. WESSINGER, of Ann Arbor, Mich., has just been re-appointed City Health Officer for a term of 3 years, this being his ninth re-appointment, Dr. Wessinger having served 24 years up to the present time.

CONFERENCES

- June 8-12, The American Medical Association, Philadelphia, Pa.
 June 14-20, National Conference of Social Work, Minneapolis, Minn.
 June 15-20, First National Conference of the American Association of Public Welfare Officials, Minneapolis, Minn.
 June 18-19, Pennsylvania Public Health Association, Harrisburg, Pa.
 June 22-27, American Home Economics Association, Detroit, Mich.
 June 23-24, Fifth Annual Conference of the Pennsylvania Sewage Works Association, State College, Pa.
 June 27-July 4, National Education Association, Los Angeles, Calif.
 June 28-July 3, Second World Conference on Crippled Children, The Hague, The Netherlands.
 June 29-July 1, New York State Con-

ference of Health Officers and Public Health Nurses, Saratoga Springs, N. Y.

July 27-August 2, The World Federation of Education Associations, Denver, Colo.

July 26-31, Third Congress of the Pan American Medical Association, held under the auspices of the Mexican Government, City of Mexico, Mexico.

September 14-17, Sixtieth Annual Meeting, American Public Health Association, Montreal, Canada.

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American Journal of Public Health

and THE NATION'S HEALTH Vol. XIII No 7

Volume XXI

July, 1931

Number 7

Iodine in Nutrition*

WILLIAM WESTON, M. D., DR. P. H.

South Carolina Food Research Commission, Columbia, S. C.

FOR more than 25 centuries it has been known that there was something in certain marine products that exercised a specific influence upon the thyroid gland. The Chinese, Phoenicians, Greeks, Romans and other peoples who had acquired an advanced degree of civilization all appear to have been in possession of this information. It was not known until Davy discovered it in 1815, that the efficacy of burnt sponges and other marine products was due to the presence of iodine, an element discovered by Courtois in 1811. In 1820 Coindet, a physician in Geneva, suggested that the beneficial effect on goiter of these marine products might be due to the iodine they contained. He conducted experiments upon goiter patients by administering tincture of iodine, with the result that the goiters disappeared. He observed, however, that certain of these patients manifested toxic symptoms and consequently he concluded that this method of treatment should be closely supervised. Among those who were investigating the treatment of goiter about this time and by whom its dangers had been observed was d'Espine, who estimated that the minimum curative dose was 0.5 mg. per day.

During this period the subject was studied from several different points of view and considerable information was accumulated that suggested the connection between iodine deficiency and goiter. Angeline in 1824, and Cantu in 1825, found iodine in certain springs which had a reputation for the cure of goiter. A few years later Boussingault observed that the sea salt of Gauca exercised a decidedly beneficial influence in the prevention of goiter in the people of the Andes where goiter was very common.

* Read before the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

In 1849 Prévost suggested that goiter was due to a deficiency of iodine and bromine in drinking water. He suggested that when iodine was present in salt it gave protection against goiter.

Between 1850 and 1854 Professor Chatin of Paris made very extensive investigations. Following these he announced that where the soils and waters were relatively high in iodine goiter was unusual, but when low in their iodine content many cases of goiter and cretinism were observed. Chatin's views were severely criticized for a period covering several years, but his basic observations have become so firmly established and have been so often confirmed, both in Europe and this country, that we may safely conclude that they are correct. Among those who have studied Chatin's observations is McClendon of the University of Minnesota. His investigations were most extensive and agree in practically every detail with Chatin's findings.

Among others whose investigations led to definite conclusions was Lombroso, who recommended that all marriageable individuals residing in goiter areas should be treated with iodine for the prevention of cretinism. I believe it was he who first recommended the use of iodine in the treatment of farm animals in goiter areas, a measure that has been largely adopted and which has resulted in saving from ruin the live stock industries in those areas.

Probably the first to suggest the use of iodine in salt as a routine measure of treatment in the prevention and cure of goiter was Koestl, who in 1855 began its use in Austria.

In practically all of the goiter areas of Europe there occurred a wave of enthusiasm for the use of some form of inorganic iodine in the treatment and prevention of goiter. It appears that a most indiscriminate use of the various iodine preparations was indulged in with many instances of poisoning.

It was not until 1860 when Rilliet presented to the French Academy of Medicine a classical description of the toxic symptoms which follow over-dosage of iodine that medical men began seriously to consider their error. Following the widespread circulation of Rilliet's report the administration of so-called inorganic iodine began to be considered by many as dangerous and by others as either impractical or ineffective. It may be pertinent to mention here that so thoroughly did Rilliet consider his subject that although it was presented 70 years ago, no one since has presented nearly so comprehensive a report. It would be well if each physician residing in the vast goiter area of this country would familiarize himself with it.

Iodine is widely distributed in nature but is present in small and variable quantities in both organic and inorganic substances. The

air, water, soils, rocks, mineral ores and marine products have for many years been considered the most important sources of iodine. Within the last few years McClendon¹ has called attention to vegetables grown in certain sections as being of great value in the prevention and treatment of goiter. In the past 2 years Remington² has analyzed hundreds of samples of vegetables and as a result of his work the subject has been greatly advanced.

The amount of iodine in the air is extremely variable. Gautier³ found approximately 16 times as much iodine in the air at the seashore as in Paris. However, von Fellenberg found that the amount of iodine in the air varies greatly in the same locality and is subject to such influences as rain, dews, altitude, and the presence of large amounts of soot.

The amount of iodine present in drinking waters is, generally speaking, of little consequence when considered in its individual relationship as a reliable source to supply the bodily requirements. However, certain springs in France and Austria are said to contain a sufficient amount of iodine to prevent goiter. Investigators, both in this country and Europe, report a very much greater amount in the water from the non-goitrous areas than in those where the goiter incidence is high. McClendon¹ found that drinking water in the lower Mississippi Valley contains 100 to 1,000 times more iodine than that in the basin of the Great Lakes. In the former district there is practically no goiter, while in the latter from 35 to 60 per cent of the children are so afflicted. Chatin estimated the amount of iodine in 300 rivers. Perhaps his most important conclusion was that water from sources rich in lime and magnesium and from melting glaciers are invariably low in iodine.

Hercus, Benson and Carter⁴ analyzed the water from 3 New Zealand rivers with the following results: the Clutha was iodine free, the Taiere contained 1 microgram and the Leith 2 micrograms per liter.

Mitchell⁵ found a wide variation in the iodine content of the different rivers in South Carolina. In the Seneca River he found 1.86 parts per billion and in the Broad 6.53 parts per billion. It is interesting to note that water taken from these rivers and subjected to treatment by chemicals and filtration resulted in a loss of iodine of from 30 to 70 per cent.

Sea water from the several oceans has been analyzed by von Fellenberg, Blyer, Heymann, McClendon and others. These waters show remarkable variation which cannot be accounted for by differences of method, because von Fellenberg⁷ found that the water from the Mediterranean contained 17 micrograms per liter, while that at

Biarritz contained 57 micrograms per liter. Although seaweed and plankton concentrate enormous amounts of iodine, the opinion which prevails that the sea is our chief source of iodine is fallacious. Soils in many places contain a greater amount of iodine than does the sea. The richest deposits are in Chile.

Iodine is present in the various metal ores and is relatively rich in some of the copper and iron ores. It does not, however, appear to have any special affinity for any metal.

OCCURRENCE OF IODINE IN THE BODY

It is difficult to state in exact terms the total quantity of iodine found in the body ash, because of certain influences, such as locality, sex, age and season. A much greater amount is found in those residing in non-goitrous areas than in those where goiter is common.

Age⁸ also seems to exercise an important influence. At birth practically no iodine is found in the thyroid gland and after the first 3 or 4 months the quantity seems to increase up to puberty. There is a slightly greater amount in the bodies of women than men, and a number of authors have noted a marked seasonal variation in this country.

The total quantity of iodine in the body of the average adult has been variously estimated by Lunde, Class,⁹ Wulfert, Justus, Sturm, von Fellenberg and others. On the average of these we may estimate it at 51 mg. Of this 25 mg. are in the musculature, 10 mg. in the thyroid, and the remainder in small proportions in the spleen, suprarenals, salivary glands, the bones, skin and blood. Certain American investigators report that the thyroid gland contains almost half of the total body iodine. This matter is largely or entirely determined by the iodine content of the diet.

IODINE REQUIREMENT

Since 1896 when the German chemist Baumann discovered the presence of iodine in the normal thyroid gland, much work has been done by chemists in Europe and America to determine the actual amount required by the body. We must remember that iodine is in constant circulation in the blood and that we have a normal iodine metabolism.

Lunde and Class¹⁰ estimate the normal iodine concentration of the blood at 11 to 16 micrograms per 100 c.c. They estimate the amount necessary to meet all requirements of metabolism at around 0.05 mg. per day. In the presence of some infection or some increased physiological activity such as puberty, pregnancy, lactation or the menopause, a greater amount is required. A simple calculation will demon-

strate this, if taken in its organic relation, to be excessive, i.e., beyond nutritional requirement. It is my opinion that less than one-tenth of this amount is more than sufficient to prevent or cure incipient endemic goiter. It is also true that people living in areas where the diet supplies an adequate amount of iodine have smaller thyroid glands, but these contain a greater amount of iodine than those of people living in areas where the glands are larger.

IODINE IN NUTRITION

Concerning the physiological functions of iodine in nutrition—(1) Iodine furnishes the most important element which enables the thyroid gland to synthesize thyroxin. The thyroid gland contains 65 per cent of iodine. Thyroxin is the hormone which regulates the basal metabolic rate and determines the rate of function of all the glands in the body. (2) A sufficient amount of iodine in the diet of the mother increases the weight and growth of the young. It also makes the young strong and more apt to survive. (3) The iodine content of the ovaries and uterus is fairly high, especially when the diet is abundant in this element. When this is the case reproduction is favorably influenced. (4) A deficiency of iodine in the diet results in enlargement of the thyroid gland—goiter. (5) A deficiency of iodine in the diet results in frigidity, sterility and frequent miscarriage. (6) A lack of iodine extending over several generations gives rise to the birth of cretins, feeble-minded children and congenital idiots, and in adults myxedema.

Lunde in Norway¹¹ and von Fellenberg in Switzerland, have independently undertaken studies to determine an accurate method of measuring the daily iodine intake. Both investigators assume that

TABLE I

<i>School District</i>	<i>Percentage of goiter among school children (J. Nicolaysen)</i>	<i>Micrograms Iodine in 24 hours (G. Lunde)</i>
Hostvedt	59.7	40
Hvittingfoss	55.0	48
Ljsterud	54.0	29
Meheia	53.6	39
Saggrenda	43.0	64
Komnes	39.7	48
Berg	38.6	56
Eftett	36.6	65
Verp	36.0	87
Ruud	30.0	61
Vik i Sogn	0.0	173

¹¹ 1 microgram equals 0.001 mg.

regardless of where one resides he is in iodine equilibrium. They both found that approximately 60 per cent of the iodine intake was excreted in the urine. These experiments were conducted in high and low goiter areas and in those who had developed goiters and those who had not. Their results appear to be uniform and accurate (Table I).

I give von Fellenberg's figures for 3 Swiss provinces and for Forte dei Marmi on the Ligurian coast for the entire population (Table II).

TABLE II

	<i>Percentage of goiter</i>	<i>Micrograms Iodine per 24 hours</i>
Effingen	1.0	70
Kaisten	61.6	17
Hunzenschwil	56.2	18
Forte dei Marmi	0.0	112

Among the most important factors that seem to interfere with the utilization of iodine in the system are a high fat or protein diet or both. Kendall¹² of Rochester, Minn., finds that of the total iodine of the thyroid gland 60 per cent is in the form of diiodo tyrosine, 16 per cent as thyroxine, and there is no inorganic iodine. This finding is significant and is in harmony with the increasing conviction of investigators that none of the chemical elements exercise an absolutely independent action. It is probable that elements other than iodine are concerned with it in the production of those manifestations that have heretofore been ascribed to iodine alone. In their work on nutritional anemia Myers and Beard¹³ report that though copper supplements iron in hemoglobin regeneration, several other metals, among them germanium, arsenic, manganese and nickel, exercise a like influence.

There is constantly accumulating evidence that the inorganic form is not the method of supplying the necessary iodine, because it is of doubtful efficacy and apparently impractical. Resurveys following the use of iodized salt in Michigan for a period of several years have not shown the expected decrease in the incidence of goiter. The addition of iodine to drinking water has also proved disappointing."

After a most diligent and careful search of the literature I have failed to find a single incidence of iodine poisoning where the diet contains an enormous amount of iodine in its organic state. Perhaps Lunde is correct in his explanation. He writes:

Investigations have shown that when inorganic iodine is supplied it leaves the body quantitatively in a rather short time (less than 24 hours), mostly through the kidneys. The organically bound iodine of foodstuffs, however, is set free only

slowly in the organism, and a longer time elapses before it leaves the body. The question of the form in which iodine is utilized in the organism has not yet been solved; it is not known whether the organic compounds are first broken down so that the iodine can be disseminated in ionized form, or whether they are utilized directly. In any case it seems reasonable to assume that organic iodine compounds play an important part in the organism, since they are present in all tissues. A number of investigators have therefore emphasized the great importance of naturally bound iodine in goiter prophylaxis instead of the inorganic form.

Sufficient work has been done in the analyses of the various foods in the United States from which to select a diet that contains all the iodine that the body can utilize. It has been shown that sea fish contain a large though variable amount. The lean fish such as haddock, cod, coal fish and halibut has a high iodine content; herring and salmon may be considered as examples of fat fish and these have a much lower content. The shell and crustaceous fish possess a much higher iodine content than any other species, though, like other varieties, they differ tremendously.

The iodine content depends upon the available food supply. In some localities it is abundant, and in others scarce; consequently we find oysters that contain only 6,000 or 7,000 parts per billion, while others will range from 15,000 to 16,000.³⁵ Lunde³⁶ analyzed the oysters from Oslo Fjord and found that they had an unusually high iodine content. In that locality the plankton, which has the ability of concentrating an enormous amount of iodine, and upon which the oysters feed, was most abundant.

Clark³⁷ determined the iodine content of certain fish along the Massachusetts coast with the following results: soft shell clams 1,152 parts per billion, quahaugs 205, and cod 1,056. Remington³⁸ found that oysters from near Charleston contained 15,799 parts per billion.

As a result of a great number of analyses made by both McClendon and Remington³⁹ we are enabled to select vegetables, either canned or fresh, that contain relatively enormous amounts of iodine. The latter found spinach grown in South Carolina that contained from 800 to 1,200 parts per billion on the dry basis, and lettuce of like value; also that beans, asparagus, carrots, and other vegetables grown in the same state were extremely rich in iodine.

It is the feeling of pediatricians in an extensive section of the country that goiter is distinctly on the increase in young children. This observation suggested the importance of analyzing the available milk supply; consequently we undertook the task at the South Carolina Food Research Laboratory, in collaboration with Dr. McClendon of the University of Minnesota. When the results are considered the explanation becomes plain.

We are conducting experiments in order to determine whether spinach or lettuce when reduced to a concentrate and added to the milk formula in small quantities will not overcome the iodine, iron and other mineral deficiencies. The analysis of the spinach" being used is as follows: iron 543; manganese 140; copper 15; and iodine 840 parts per billion.

The lettuce" contains, approximately, iron 4,000 parts per million and iodine 900 parts per billion. Results are so far most gratifying.

Scharrer and Schwaibold" attempted to find out the form in which iodine is combined in milk. They separated the curd from the whey in normal goat milk. No iodine, or only traces, were found in the curd. Even when the animal was fed iodides, less than 1 per cent of the iodine of the milk was in the curd. Normal cow's milk, dried and powdered, gave the following:

Fat	4.5 % of total iodine
Protein	3.0 " " "
Serum (organically combined)	60.5 " " "
Serum (inorganic)	4.0 " " "

They concluded that only a very small part of the iodine of milk is in the inorganic form and that most of it is combined with the organic substances of the serum.

Where people do not have goiter or other manifestations of iodine deficiency they receive iodine in its organic relation as it exists in milk, vegetables and fish. There are one or more elements in this organic combination that not only determine the rate of assimilation but its availability as well.

DISCUSSION

J. C. GEIGER, M. D., F. A. P. H. A.

George William Hooper Foundation for Medical Research, University of California Medical School, San Francisco, Calif.

ONE of the striking things in medical history is the geographical distribution of goiter. The highest incidence is found in parts of the Alps, Pyrennees, and Himalayas; the Thames valley in England; certain inhabited districts of New Zealand; the region of the Great Lakes, and the northern Pacific Coast.

Chatin, a French chemist, in 1850 introduced the hypothesis that endemic goiter was due to iodine starvation or insufficient iodine in food and water. Some of the preventive measures used today were first mentioned by Chatin and forgotten, namely, potable water known to contain iodine, food grown in goiter-free regions, and iodized salt.

Marine's observations stimulated further interest in the theory of iodine starvation. Curiously, his reasonings were initiated when the use of iodine in water prevented thyroid enlargement in trout in hatcheries. Later Marine began his classical study with the children of Akron, O., and goiter surveys and chemical analyses of soils and water began in earnest. Apparently, wherever iodine content of water is less than 23 parts per billion goiter is common. Likewise, food grown in the so-called goitrous region may be low in iodine content.

McClendon states that oats grown in Minnesota contain 10 mg. of iodine per metric ton while near Wiscasset, Me., the content is 175 mg. This same author has recently published an exhaustive survey of the soils of South Carolina and, unfortunately, compared the results with those of California, to the detriment and chagrin of the latter.

Usually, the green vegetables, milk and fruits grown in goitrous regions are richest in iodine. There is little in wheat, and therefore flour, for it is mostly in the bran.

According to McClendon, the normal thyroid gland contains about 40 mg. of iodine. In experimental diets, the intake and outgo being carefully determined, it would require 40 years to accumulate 40 mg. Rochester, N. Y., adds iodine to its water supply, using about 1/10 lb. of sodium iodide per million gallons of water.

Historically, it is of interest to record data as to the Goiter Springs or Krapbrunner in Europe. These springs became quite celebrated because of the hope that the waters would produce goiter in those drinking it and debar the recruit from military service. The water was enormously filthy from the bacteriological standpoint.

One of the extraordinary facts of recent medicine and surgery is that goiter may be a factor in the occurrence of malignancy or cancer. For instance, in the Berne, Switzerland, area, an endemic center of goiter, the occurrence of malignant growths is about 1 to 100, while in the United States it is 1 to 1,000.

The clinical use of so-called glandular extracts in the treatment of cancer is based on the theory that one of the causes of cancer may be some unwholesome biological condition of the internal glands, particularly the thyroid and the suprarenal. There is no doubt that heredity plays its part in goiter as in cancer. Familial tendency to goiter has even occurred for three generations, and members of goitrous families have developed the disease or tendency while living in different regions. Shivers mentions the fact that there must be some reason why a goitrous mother will have goitrous children, particularly girls. King's opinion is that the simple adenomatous goiter is congenital and is subsequently stimulated by iodine deficiency, pregnancies, and mental and physical stresses. Exophthalmic goiter, however, depends on mental or emotional disturbances, trauma and shock. Finally, the colloidal goiter is due to iodine deficiency.

Jordi's feeding experiments on tadpoles in the laboratories of the Hooper Foundation of the University of California, using normal and abnormal thyroid, showed remarkable variations in growth, particularly with the normal. With this the animals showed marked decrease in size when compared to the usual controls. With abnormal thyroid, there occurred *specialized* effects on growth, indicating that dysfunction is by no means a minor clinical matter.

Whatever the cause or effect, the general public should note primarily the factor of iodine deficiency in food and water. General dosage of the people with iodized salt, chocolate iodine, or iodine in water supply should only be done under careful supervision of qualified physicians. Even then the question of goiter prevention in

the mass may be fraught with danger, and caution is urged accordingly. Moreover, it must not be overlooked that iodine in soil may or may not be in a soluble form and in different amounts in different types of soils. It appears that organic iodine in soil is a prerequisite for iodine containing vegetables. In addition, the significance of iodine in underground water supplies may overshadow the contents of surface soils. Likewise, appreciable quantities of iodine in food are not lost in cooking in the pot or processing in the can.

Apparently, as soon as the store of iodine in the thyroid gland falls below 0.1 per cent, the gland begins to enlarge. Finally, iodine can be safely given to those between the ages of 10 and 20 years living in goiter areas, but under medical supervision. Usually, small doses of iodine several times a year will guard against injury by the iodine.

Laboratory and Clinical Resources in Physical Examinations

THE appearance of articles in medical publications arguing the respective merits of clinical and laboratory methods is evidence that the medical profession has not fully comprehended the possibilities of preventive medicine. The complete physical examination of the apparently well does not necessarily require the use of all the laboratory aids at the disposal of the medical profession. At the same time, failure on the part of the examining physician to avail himself of the benefits of laboratory studies that he thinks unnecessary may result in a mistaken diagnosis. The patient who seeks a physician because of a discomfort that to his mind has not reached the dignity of an illness is entitled to receive the benefit of all the aids that clinical and physical laboratories have to offer. The question of cost should not enter into the calculation. If the patient is unable to pay, his recourse is the charitable institution. If the patient is able to pay, he should certainly not be denied the service.

* * * * *

Today physicians in increasing numbers realize that laboratory findings stimulate alertness of observation as well as compel more painstaking physical examinations. They are learning that when laboratory and clinical findings conflict, further clinical study of the patient will often explain the seeming discrepancy. Many things accepted as facts are based on wrong conclusions of preceding observers. Only careful and recorded studies of the apparently well and slightly ill will disclose such errors.—Keating, Emmet, M.D., *In at the Death*, *A. M. A. Bull.*, Nov., 1930.

Local Public Health Work in Mexico*

MIGUEL E. BUSTAMANTE, M. D., DR. P. H.

Assistant Director, Bureau of Communicable Diseases, Federal Department of Health, Mexico City, Mexico

IN Mexico, the Constitution makes the Federal Department of Health the supreme authority in matters of hygiene, and the *Sanitary Code* is the basis for federal action. The present program to help the cities toward the organization of their municipal hygiene is fostered and directed by the Federal Department of Health, with the coöperation of the most progressive and advanced states. The fundamental requirement for the formation and establishment of local sanitary institutions is the effective and substantial economical support of the local authorities. The existing health units carry on, thanks to a strong and generous federal support, which we hope will gradually give way to due appropriations from the local budgets.

When a state and a municipality, as happens in Veracruz, are ready to coöperate financially and administratively, the Federal Health Department is willing to give support, favoring and directing the establishment of permanent sanitary centers, which become a part of the community, doing a continuous beneficial hygienic work which can be seen and appreciated by the people.

While some states have boards of health with modern programs of preventive medicine and hygiene, others have no organization which could be rightly so considered, from the public health standpoint. As you are well aware, it has been difficult in all countries to awaken the municipalities and local authorities to their responsibilities in providing administrative and financial facilities for public health work. We read that to start the work in most counties of the United States it has been necessary to insure the coöperation of the U. S. Public Health Service and the International Health Board with the local authorities, which finally has resulted in the existing county health work with technical direction and economical coöperation on the basis of \$1 from the federal government, \$3 from the state government, and \$4 or more per capita from the municipality.

* Read at a Post-Convention meeting of the American Public Health Association in Mexico City (following the Fifty-ninth Annual Meeting in Fort Worth, Tex.), November 3, 1930.

A greater development of health units will come in Mexico when a legal provision is established to enable the Federal and State Health Departments to offer to those communities which will accept their responsibilities, effective technical advice along with proportional financial coöperation.

Coöperative health work began in the United States in 1920, and promptly spread all over the world, giving a new hope and a new element of victory to the hygienists of the world. In Mexico it was initiated in 1925, the first Mexican sanitary unit having been established in Minatitlan and Puerto Mexico in 1928, followed by one in Veracruz, May 17, 1929; one each in Tuxtepec, Oaxaca, and in Tierra Blanca, Veracruz, in 1930, forming the nucleus of city and rural modern coöperative health work.

The progress has not been so slow if we consider the difficulties of creating at the same time—parallel to the coöperative health organizations—a public spirit, comprehensive enough to ask for the services of sanitary organizations of an apparently complicated type. Here again the experiences of the United States and Mexico are similar, that is:

In the administration of public health the states are sovereign units, and the experiences gained in one state cannot be put to use in a less progressive state except by the process of demonstration, education and slow growth.

In our Republic, the type of rural communities where the public health activities are most needed is almost uniform in one respect—the lands of the municipality lie around a center where all the houses are grouped to form the village or town proper. We do not commonly see, as in the United States, the farm owners, their families and workers living on their respective lands, but rather in the villages or what we call "pueblos." The agriculturists start their daily work by a trip from the town to the surrounding fields, returning at sunset to the village where they live.

These towns all have market-places for exchange of daily commodities, using common water sources, either a river, various wells, or a spring. When the people move to sell their crops and products from one town to another, they all go on the same day and almost at the same time. This rural situation gives to the epidemics certain aspects, which good observers have followed on the map—as well as on the calendar. Dr. Pardo writing about a typhus epidemic, in 1915, in the City of Oaxaca and the neighboring towns, speaks about the spread of the disease from place to place following the market day in each: Thursday for Ejutla, Friday for Ocotlan, Saturday for Oaxaca, Sunday

for Tlacolula—the movements of the people in the Valley of Oaxaca, and the spread of the disease coinciding with their commercial relations.

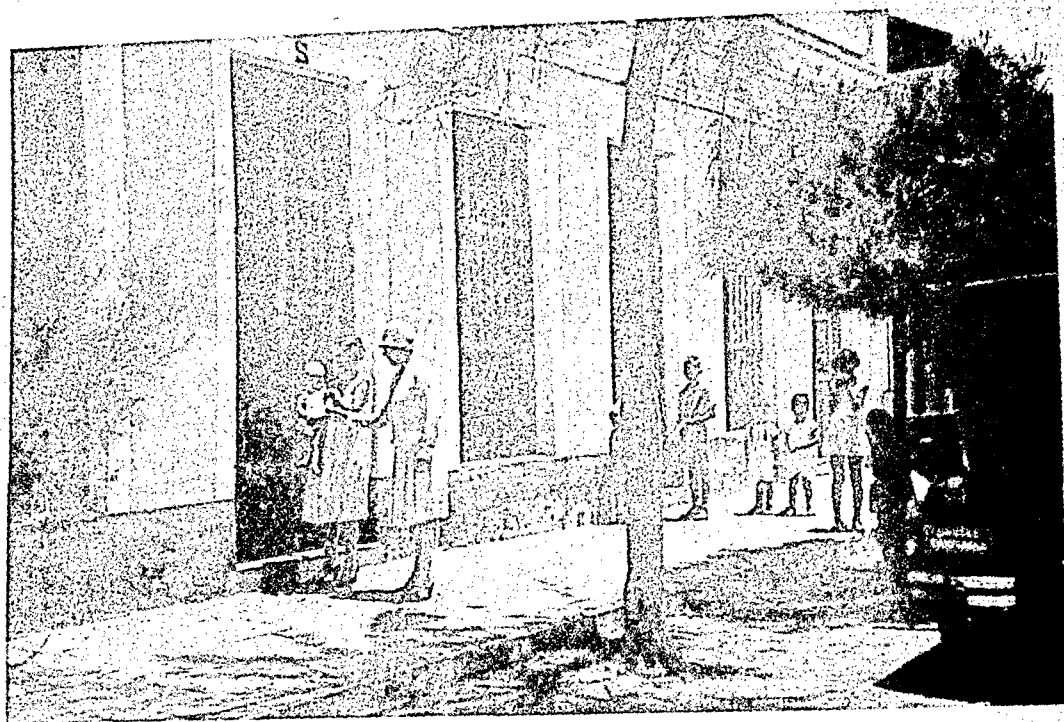
The contaminated water of a source which is generally used for most of the people is equally dangerous for all inhabitants; instead of dealing with family typhoid the case is one of village typhoid. Our greatest general public health problem is the lack of adequate provision of pure water and its complement for the sanitation, sewage disposal. The heavy expense involved retards the solution. We do not ignore the facts and are anxious to correct them, but our limitations are those of any reconstruction period, overcrowded with many pressing problems. Among them are extension of popular education, good road communications, and modern disease prevention to reduce our high morbidity and mortality rates. It is not difficult to understand the amount of energy, the intensity of effort, and the greatness of the ideal which we need to carry us through a task of centuries in a score of years.

PUBLIC HEALTH IN VERACRUZ

As previously stated, the first coöperative sanitary unit was established in April, 1928, to work jointly in the municipalities of Minatitlan and Puerto Mexico. It has, as all the others have, the coöperation of the Federal Department of Health, the State Direction of Health, the two municipalities, and the International Health Board of the Rockefeller Foundation. This unit gives its services to a total population of 25,000 people and has the following fundamental principles:

1. The basis of all procedures is public health education.
2. All the sanitary personnel are chosen for their experience, training and standing.
3. All employees are full-time, devoting their energies to this one work. This applies to the Director, who is a full-time Health Officer.
4. The organization is permanent in the place where it is established.
5. The work is done with the strictest economy of expenditures.
6. Technical and financial support must be given in full coöperation by the civilian and sanitary authorities.

With this general basis, on May 16, 1929, the City of Veracruz witnessed the inauguration of a coöperative sanitary unit to serve a population of 70,000 people. The establishment of this unit constitutes a progressive step in the sanitary services of that city, because of its importance as Mexico's principal port, and because of the special services which the Federal Department of Health has maintained in Veracruz since 1920, with the object of preventing the return of yellow fever and bubonic plague to the country. The yellow fever campaign



VISITING NURSE, VERACRUZ

was extended some years ago to anti-larval work for malaria eradication, and its total accomplishments are a natural link and support to the new institution.

It was justifiable to pass from the campaigns against yellow fever, malaria, and bubonic plague, to a most comprehensive and extensive health program, with the desire to complete the hygienic work, using the results obtained by the expenditures of the preceding years to promote the control of other communicable diseases and to establish prenatal and postnatal clinics, to start school hygiene work, to provide laboratory facilities for diagnosis and prevention, adding sanitary engineering and inspection for the supervision and control of foods, particularly milk and water.

We must say here a few words about some high spots in the history of the sanitary work in Veracruz, and pay a tribute of admiration to the public health workers the effect of whose labor appears clearly in the mortality statistics of the past 40 years. Veracruz was a victim of yellow fever, malaria, tuberculosis, and gastrointestinal diseases up to 1903, when the first public health activities of significance were directed by the glorious Dr. Liceaga, then President of the Superior Board of Health.* His intelligence and influence had obtained, when the artificial construction of the port was about finished, the introduc-

* President of the A. P. H. A. in 1896.

tion of the water supply and the installation of the sewage disposal system, which were concluded in 1904.

With the sanitation, Liceaga started the modification of Veracruz, and September 1, 1903, began his famous campaign against yellow fever. His coworkers were Drs. del Río, Macías, García Iturralde and Manuel S. Iglesias, the latter three times vice-president of the American Public Health Association. He lives now in Veracruz and relates in very interesting articles how yellow fever was eradicated for the first time from that city in 1910. After bringing in the water supply, introducing the sewerage system and destroying the breeding places of the *Aedes Aegypti*, the health of Veracruz was marvelously improved. The crude annual death rate per 1,000 went down from 63.88, average for the 10 years preceding Liceaga's work, to 44.58 for the decade following. The rates for the principal causes of death changed as follows: gastrointestinal diseases, from 126.57 in 1898 to 46.20 in 1909; malaria, from 109.53 in 1903 to 38.96 in 1910; tuberculosis, from 124.86 in 1898 to 50.91 in 1911; and yellow fever from 191.61 in 1899 to disappearance in 1910.

Ten years later, 1920, Veracruz suffered the return of yellow fever which was extinguished in 1921 by the combined efforts of Drs. Malda, Lyster and Brioso Vasconcelos, Caldwell, Graham Casasús, Macías, Loyo and Ojeda Falcon. The same year brought a new scourge, bubonic plague, which however was quickly extinguished by the adoption of deratization measures. The statistics show a sad elevation to very high mortality rates from 1915 to 1920, and the return of the above mentioned epidemics imposed the necessity of renewed activity to solve the public health problems of Veracruz.

For years, attention was given only to the anti-larval and anti-plague services, from the results of which came the desire to reduce still more the too high morbidity and mortality rates. To do so, it was necessary to secure the coöperation of the federal, state, local, and International Health Boards, and in 1929, the coöperative Sanitary Unit of Veracruz was established.

The Sanitary Unit of Veracruz follows in a general way the principles and programs which the experienced public health workers, particularly those of the American Public Health Association, teach in the *Journal* and other publications, and also the advice given by European hygienists in the League of Nations papers relating to hygiene. Particular recognition is due also to the professors of the School of Hygiene and Public Health of the Johns Hopkins University and the International Health Board for their teachings.

The technical advisers of the Unit are: the Chief of the Federal

Health Department, the Director of the State Board of Health, the Sub-director of the Hookworm Campaign, representing the International Health Board, and the City Councilor of Sanitation, nominated by the City Government. This body of advisers constitutes the Superior Board of Technical Directors.

The institution is adapted to the particular conditions due to educational, psychological and economic factors prevailing in Veracruz. The organization has the following sections or bureaus:

SANITARY UNIT OF VERACRUZ

Direction with:

Education and training of personnel

Public health education:

Posters

Circulars

Lectures

Motion pictures

Vital statistics:

Collection from the Civil Register

Classification

Interpretation

Organization and administration

Communicable disease control:

Diagnosis, immunization, hospitalization:

Reporting

Maps and cards

Control practices

Antilarval service for:

Yellow fever prevention

Malaria control

Antirabic treatments:

Animal vaccination against rabies

Bubonic plague prevention

Smallpox vaccination

Typhoid and paratyphoid fever control

Tuberculosis control

Venereal disease control

General communicable disease control

Hookworm diagnosis, treatment and prophylaxis

A. Child Hygiene:

Prenatal service

Infant hygiene service

Visiting nurses and propaganda

B. School Hygiene:

Physical examinations

Dental hygiene

Visiting nurses

Laboratory:

Diagnosis and bacteriological examinations

Conservation and distribution of vaccines, serums, antitoxins, and chemical products used against malaria, syphilis, and dysentery

Preparation and distribution of material for collection of samples

Inspection of Foods and Beverages:

A. Veterinary Inspection:

Sanitary control of milk

Meat inspection and markets

Fish and shellfish sanitation

*B. Sanitary inspection of foodstuffs, refreshments, soft drinks, and food handlers**Sanitary Engineering:*

Street cleaning service

Inspection of sanitation in hotels, boarding houses, etc.

Technical advice in relation to the water supply, control of chlorination

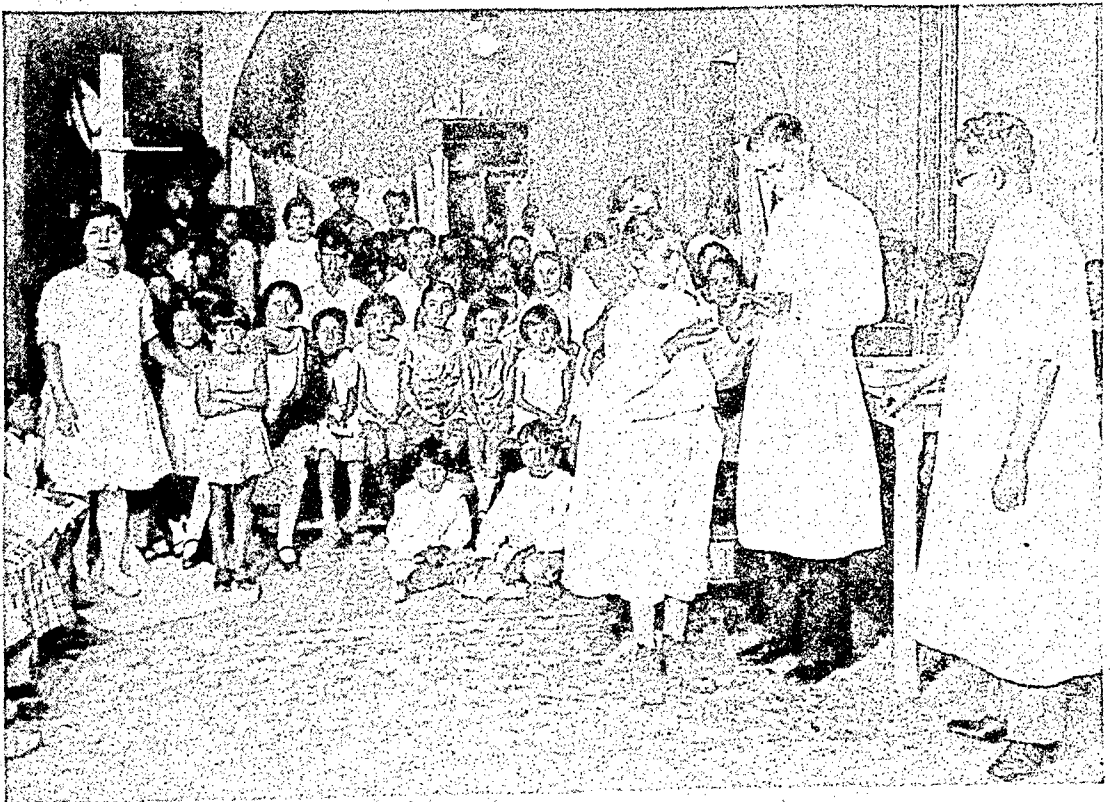
Technical advice in relation to sewage disposal

Surface drainage, filling and ditch conservation for the antimalarial work

General problems of sanitary engineering

Building inspection

The program of work has been carried on since May 16, 1929. To begin with, there were taken on the then existing Federal Health Services, namely, the anti-larval, the anti-plague and the anti-rabic. The street cleaning which was previously done by the municipality was re-organized; all usable equipment repaired, and new and modern trucks were purchased to insure an efficient service. Immediately the Hookworm Clinic was initiated with treatments and lectures, the laboratory opened, and meat inspection established. In addition, reporting of communicable diseases, home visiting, and measures of control began to be taken. By the middle of August, 1929, the Venereal Disease Clinic was ready, and by the end of the same month the prenatal and postnatal centers were opened. In November, the work of school hygiene was initiated, and finally on January 26, 1930, we had the satisfaction of completing the organization of a Maternity Home and



HOOKWORM CLINIC, VERACRUZ

Nursery School under the administration of the Veracruz Sub-committee of the National Association for Infant Protection, which though separated from the Health Unit, economically and administratively, depends upon the medical services and advice of the director and technical personnel of the Sanitary Unit.

The kindness of the women in charge gives to us the full coöperation of their association, and with their help, our program for child hygiene goes as follows:

Prenatal care—Given in the clinic of the Sanitary Unit. Examination, instruction and care of pregnant women.

Natal care—In the Maternity Home of the local Committee for Infant Protection.

Postnatal care—From birth to 2 years of age, in the clinic of the Sanitary Unit.

Preschool hygiene—From 2 years to school age in the nursery school of the Committee for Infant Protection.

Hygiene of the School Child—Physical examinations by the Child Hygiene Section of the Sanitary Unit.

In Veracruz the principal obstacle is the lack of public health education. Although the people are ready to accept clear explanations, the general bystander thinks that the principal occupation of the department should be the correction of nuisances, particularly if they produce offensive odors. The Health Officer is very often transformed into a judge of complaints which belong to the police or are matters of the city ordinances and not of the sanitary laws.

At present our outstanding problems are the reduction of morbidity and mortality for gastrointestinal diseases, tuberculosis, and typhoid fever. To compare the changes in the numbers of deaths and death rates of the mentioned diseases Table I is presented. Yellow fever, bubonic plague, and smallpox have been eradicated. Tuberculosis, which had the rate of 1,250.5 per 100,000 in 1892, still had the high rate of 423.8 in 1928; however, the lowest in 39 years.

There is at present a general decline. Deaths from gastrointestinal diseases were at the lowest rates known in Veracruz from 1907 to 1911. They went up in 1915, and these diseases remain now the principal causes of death.

Malaria was so high early in the century that it occupied the first place among the causes of mortality in 1903, but the work against yellow fever and general sanitation brought the rates down, only to rise again in 1915, going above tuberculosis in 1918 and 1919, and from then on the fall has been constant, due to the anti-larval work, with the result that last year malaria ranked 8th as a cause of death. Oiling, stocking with minnows, drainage, filling of swamps and Paris



OLD TYPE OF MILK MEN SELLING MILK FROM HOUSE TO HOUSE

green are used against malaria. House-to-house inspections and destruction of breeding places are a daily feature of the anti-mosquito work.

In 1929, the crude death rate of 27.55 per 1,000 was the lowest in the 40 years of our statistics. For the 9 months of 1930 the rates are: birth rate, 44.39 per 1,000; crude death rate, 26.14 per 1,000; infant mortality, 100.15 per 1,000 living births. To be sure, we are not satisfied, but merely encouraged by present conditions. However, our desire and effort is to reduce further the rates to approximate those of the leading countries in public health work, particularly the United States, where our knowledge of sanitary science has its source.

Following the example of other cities in the reduction of disease we began to attack the water-borne diseases, among other measures petitioning the Committee on Material Improvements and the municipality to chlorinate the water supply, for which they installed a chlorinator February 22, 1930. Unfortunately the water supply and sewerage systems, adequate in 1903, are entirely insufficient and in bad condition for 1930, due to the increase in population, extension of the city's boundaries, and lack of thorough repairs.

A milk ordinance for the State of Veracruz issued to take effect February 17, 1930, has been applied gradually in the City of Veracruz and the following changes have taken place in one year. In May, 1929, all milk was sold from house to house by men on mules or horses.

TABLE I
CRUDE DEATH RATES, CITY OF VERACRUZ, MEXICO—1891-1929
ALL CAUSES AND PRINCIPAL CAUSES OF DEATH

Years	Popu- lation	Number of deaths excl. of still- births	Death rate per 1,000	Deaths due to gastro- intestinal diseases	Death rate per 10,000	Deaths due to tubercu- losis	Death rate per 10,000	Deaths due to yellow fever	Death rate per 10,000	Deaths due to typhoid fever	Death rate per 10,000	Deaths due to small- pox	Death rate per 10,000	Deaths due to bubonic plague	Death rate per 10,000
1891	19,377	1,311	67.65	112	121.37	241	118.66	178	58.31	1	0.51	0	0.51	0	0
1892	20,554	1,433	69.71	172	125.03	257	126.00	259	71.51	2	0.97	0	2.91	0	0
1893	21,731	1,350	62.12	169	119.61	260	59.82	130	30.37	0	0.00	7	3.22	0	0
1894	22,908	1,537	67.06	215	103.45	237	90.36	207	25.75	1	0.43	34	14.84	0	0
1895	24,085	1,348	55.96	167	98.81	238	58.12	140	22.42	1	0.11	0	0.00	0	0
1896	25,800	1,367	52.98	199	103.48	267	0.00	0	47.28	7	2.71	10	3.87	0	0
1897	27,516	1,556	56.54	281	114.11	314	0.14	4	66.87	4	1.15	1	2.54	0	0
1898	29,231	1,995	68.24	370	124.86	365	43.78	128	84.15	1	0.31	0	0.00	0	0
1899	30,917	2,423	78.29	362	111.80	346	191.61	595	92.41	1	0.32	19	6.13	0	0
1900	32,663	1,910	59.39	303	92.76	322	80.21	286	67.35	1	0.30	177	54.18	0	0
1901	34,708	1,839	52.98	327	96.23	331	220	262	65.11	0	0.00	4	1.15	0	0
1902	36,751	2,339	63.63	361	100.12	368	29.38	226	100.91	1	0.51	21	5.71	0	0
1903	38,800	2,479	63.89	379	101.29	393	96.65	375	109.53	2	0.00	2	0.25	0	0
1904	40,815	1,714	42.69	312	90.09	368	2.93	12	57.77	0	0.23	0	0.00	0	0
1905	42,891	2,010	47.10	340	102.58	408	5.36	23	83.70	1	0.22	3	0.66	0	0
1906	44,937	1,816	40.41	302	88.11	461	2.67	12	55.85	1	0.42	4	0.85	0	0
1907	46,982	1,776	35.65	225	85.02	414	0.21	1	50.87	2	0.20	3	0.61	0	0
1908	49,028	1,980	38.76	246	67.91	419	3.87	20	50.58	1	0.97	15	2.93	0	0
1909	51,074	1,622	30.20	236	46.20	317	0.78	3	40.52	5	0.26	0	0.00	0	0
1910	53,120	1,620	30.20	262	49.32	311	0.18	1	38.96	12	0.74	1	0.18	0	0
1911	53,630	1,918	35.44	272	50.71	273	0.00	0	41.19	4	1.10	0	0.00	0	0
1912	54,141	1,821	33.22	407	75.17	308	0.00	0	33.43	6	0.73	19	3.47	0	0
1913	54,651	1,709	31.27	268	49.04	328	0.00	0	28.73	4	0.36	53	9.60	0	0
1914	55,162	1,857	33.66	435	79.38	277	0.00	0	12.68	2	10.23	316	56.76	0	0
1915	55,672	3,807	68.38	1,437	258.11	474	0.00	0	18.68	57	10.23	109	19.40	0	0
1916	56,183	3,495	62.20	1,218	216.79	449	0.00	0	51.26	110	19.57	29	5.11	0	0
1917	56,693	3,310	58.42	842	148.51	342	0.00	0	30.86	4	0.07	2	0.34	0	0
1918	57,204	2,703	48.11	607	106.11	394	0.00	0	69.05	45	7.86	2	0.17	0	0
1919	57,714	2,674	47.16	577	99.97	386	0.00	0	68.61	33	5.71	1	1.03	37	63.54
1920	58,225	2,974	51.98	582	99.95	395	26.44	151	59.58	33	3.95	6	1.71	0	0
1921	59,463	2,343	40.59	521	87.61	340	1.34	8	39.52	26	4.37	6	0.98	0	0
1922	60,701	2,251	38.66	502	82.70	343	0.00	0	31.63	42	6.91	19	3.06	0	0
1923	61,939	2,208	37.13	485	78.30	318	0.00	0	25.50	21	4.39	31	4.90	0	0
1924	63,177	2,574	42.40	736	116.40	418	0.00	0	25.50	31	4.90	43	6.67	0	0
1925	64,415	2,638	40.95	844	131.02	402	0.00	0	24.60	35	5.43	0	0.00	0	0
1926	65,653	2,439	37.14	596	90.78	314	0.00	0	21.01	48	7.31	0	0.00	0	0
1927	66,891	2,290	34.23	495	74.12	324	0.00	0	19.88	61	9.56	0	0.00	0	0
1928	68,129	1,970	28.91	505	74.12	290	0.00	0	14.12	50	7.33	0	0.00	0	0
1929	69,367	1,938	27.93	485	70.91	307	0.00	0	6.34	38	5.49	0	0.00	0	0

Less than 1 per cent of the supply was bottled, none was refrigerated, and there was widespread adulteration and use of chemical preservatives. By February, 1930, all milk was bottled, handled in especially equipped distributing centers, called "Lecherías," which are required to be painted white and screened, and distribution is done by means of trucks or milk wagons. By August, 1930, more than 75 per cent of the supply was refrigerated at 10° C., and we expect shortly to have 100 per cent milk refrigeration. The daily inspection and laboratory examinations show that adulteration and use of chemical preservatives have been reduced to 0.11 per cent.

The general public is open minded and receives willingly the new services when they show their advantages. Mothers visit freely the prenatal and postnatal clinics, and the attendance of pregnant women has increased steadily from August, 1929, to August, 1930. The monthly average of new examinations is 52, with 237 reexaminations and 17 deliveries of mothers visiting regularly at the clinic. The examination of infants brought for advice has increased from 142 per month for 1929, to 282 per month for 1930, an increase of almost 50 per cent. The follow-up work done by the visiting nurses gives good contact with the people, and generally they are well received by the mothers and families.

The hookworm clinic shows proudly 17,798 treatments in 17 months, an average of 1,450 per month, without any serious accidents. Two hundred and sixty-four lectures have been given and practical demonstrations of hookworm eggs and larvae are used as educational methods.

For 16 months not a single case of smallpox has been recorded in the city. The venereal disease clinic, the first to be established for public health work in Veracruz, has had a monthly attendance of 150 patients. Moving picture propaganda has been shown at clubs, unions and lodges.

The laboratory service makes constant analyses of water, milk and other foodstuffs; examinations are made for diagnosis of malaria, typhoid fever, syphilis, tuberculosis and other diseases. The fecal examinations for intestinal parasites have shown 7,074 positive specimens for hookworm eggs; 5,929 for ascaris; 12,566 for trichocephalus.

The Sanitary Engineering Bureau has controlled the chlorination of water and ice, the drainage and filling of swamps for anti-malarial work, street cleaning service, and building and housing inspections. Among the principal works accomplished are the construction of the Avenida Cuauhtemoc ditch, and the straightening of the Avenida Revillagigedo channel, which have saved the city from the inundation of the sand dunes' water shed.

The personnel is 100 per cent full time, honest and enthusiastic, and it is due to their earnest work that something has been accomplished. The Federal Health Department has given full support without any restrictions, and their generous attitude is particularly responsible for the existence of the Unit. Their part of the budget is 84.24 per cent. The State Direction of Health has given aid to the budget of 1.71 per cent, and has published different ordinances. The city, due to financial conditions, has not been able to increase its share, 12.33 per cent, but has accepted suggestions from the Unit for water purification. There is a strong general and popular desire to obtain for the city a good water supply and sewage disposal, which will prove an immense good when completed, with the support of the Board on Material Improvements. The Rockefeller Foundation contributes 1.71 per cent of the budget, and has an adviser on the Board of Directors.

Besides the already existing Units in Veracruz, Minatitlan, Puerto México, Tuxtepec and Tierra Blanca, other cities are organizing local health services. All states have delegations from the Federal Department of Health, and many of them local councils of hygiene. In different towns we notice a growing interest in the organization and development of the Units, and because of the ever progressive and modern ideas of the authorities of the Federal Department of Health we are sure that the municipalities with enough civic spirit and desire to pay for their own health will make a good investment, with a proportional support from the Federal Government.

Then with all the nation working for its health, united in a good program of disease prevention and health promotion, the present generation will see passing forever from our statistics thousands of preventable deaths, the coming of healthier citizens, and medical science not only the consolation of the sufferer and cure of the sick, but the teacher and provider of a healthier and happier life.

Pasteur, Koch, Ross, Gorgas, Finlay, Liceaga, Ferrán, Cruz, Carrión, heroes of humanity, have passed from hand to hand the torch of light for us to follow.

The Public Health Nurse in a Rural Health Department

An Introductory Report on the Study in Progress in Cattaraugus County*

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THE generalized public health nurse is recognized as so important an agent of the present and future health department that the development of her activities requires careful consideration and appraisal by those who are interested in the trend of public health administration and in the evaluation of its results. In those localities where a generalized nursing system has been put into operation, more and more manifold duties are being assigned to the nurse; greater responsibilities are being placed upon her shoulders; and a keener initiative is being demanded of her. In fact, her very designation as "nurse" is becoming a misnomer, for she is expected to be also the teacher and sanitarian who is required to carry into the home, school, clinic, and welfare station, the interpretation and explanation of modern hygiene, and put into effect the approved and newer measures for prevention of disease and promotion of health.

These newer functions are well illustrated in the experience of the Rutherford County Child Health Demonstration which was that the generalized nurses "proceeded to occupy—as completely as they could in view of the scattered rural population—all the accepted fields of public health nursing service," and "the shuttle services between the health department, the private practitioners, and the individual, tended to unify and simplify, in the popular mind, the meaning of the whole enterprise."¹ Or again, in reviewing the experience of the general health demonstration in Cattaraugus County, it was stated:

The public health administrator realizes that scarcely a wheel can turn in his health machinery without the nurse. To say that she is indispensable to the program does not cover the fact. To a great extent, her work *is* the program. It is one thing to have a certain number of nurses. It is quite another to have the work

* This is the first of a series of papers presenting the results of studies of public health nursing in different types of official health administrations.

of these nurses thoroughly interrelated with an active clinic service, with systematic communicable disease control, with comprehensive local laboratory work, all properly set in a routine that binds the whole into one fabric.²

It is inevitable that, in the process of this development, some confusion exists as to what the proper functions of the official public health nurse are and as to what directions they should take. This is evident in the current discussions of the precise rôle the generalized nurse should play in the many activities in which she already is engaged; of the amount of time that she should give to school hygiene, or to infant welfare, or to tuberculosis or other public health activities in order to bring about what we like to call a "well balanced program"; of whether or not less professional training as a nurse and a greater emphasis on public health training would fit her better for the job which she has to do; and of the persistent question of generalized versus specialized public health nursing. It would seem that the time has come, at this stage of the development of the official public health nurse, for more or less detached studies of the actual work performed by her in different types of rural and urban health administrations.

These studies should help in answering questions as:

To what extent does the public health nurse serve the entire population of different types of communities and in different types and kinds of health administrations?

Using records of births, school defects, illness among school children and in the general population, the findings of examinations and inspections of preschool children, communicable disease reports, clinic records of tuberculosis, venereal disease and the like, as indications of the demand or the needs for nursing services—to what extent does the official public health nurse supply this demand or meet these needs under varying conditions?

How effective is the work of the public health nurse in accomplishing its objectives in each specific activity in which she engages?

To what extent does she come into contact with conditions not reached through channels already provided by the official and voluntary agencies?

What duties now performed by the public health nurse could be performed by some other type or types of workers without, perhaps, her professional training, but with more specialized training in certain directions?

What is the "case load" of a public health nurse working in an official health administration?

What basic considerations should be taken into account in formulating the nurse's program of work if an analysis of her job is made from the point of view of the administration as a whole?

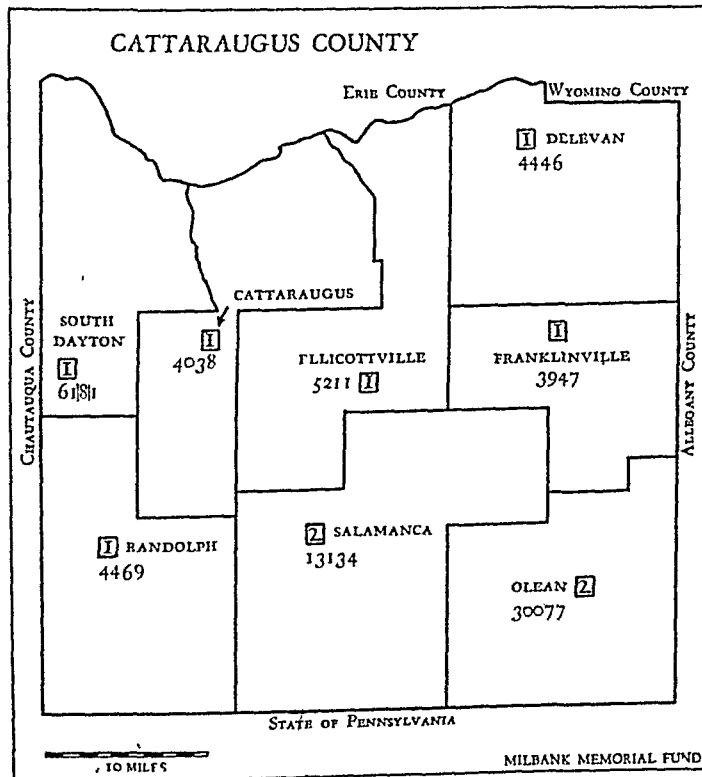
To what extent do physical factors interfere with the performance of her duties, such as distance, the weather, and the condition of roads?

It is easy to theorize in attempting to answer such questions as these and to set up programs of work and schedules of activities that

look well on paper, and even to formulate standards, such as those tentatively set forth in our "appraisal" forms. Obviously, the more factual data available, the more accurate will be our analyses, and the more sound our conclusions and our standards. By factual data is meant not merely the statistical record of the volume of work of the nurse, but the more intimate picture of conditions under which she "carries on"; the problems which she encounters; the services she actually renders; and the things she is able to accomplish.

As a beginning in a series of studies of the work of the official public health nurse, the Research Division of the Milbank Memorial Fund naturally turned to the experience of Cattaraugus County, where the Fund has been assisting in the establishment of a well rounded county health department. This paper is an introduction to the more complete reports in preparation, and deals specifically with the *home visits* of public health nurses. The experience of the nurses in all phases of the work for a year will form the basis for the more complete reports. The following discussion utilizes a sample of the records that represents the actual experience in home visiting of approximately the equivalent of 3 nurses for 6 months. It is offered as a progress report on an experiment in the collection and use of data for the purpose of throwing further light upon factors requiring administrative consideration.

The Cattaraugus County Health Department, serving a primarily



Map showing the division of the county according to nursing districts, with the population of each, exclusive of Indians. The squares indicate the location of the district health stations, and the numeral within the square, the number of county staff nurses working in that district.

The central administration office is in the Olean district. The city of Olean, with a population of 21,350, employs school and city nurses. There is also in this district a community nurse supported by the residents of Portville to serve its population of 1,435.

One of the county nurses in the Salamanca district serves a population of 9,900 in a concentrated urban area. The city of Salamanca employs a school nurse.

rural area of 1,343 square miles, has sponsored a generalized nursing service for several years. The number of staff nurses has varied from 14 to 10, the present personnel consisting of a director of the Bureau of Nursing, 2 supervisors, and 10 staff nurses. The population of the section allotted to each nurse has varied from approximately 3,500 to 4,500, the latter figure representing the present average potential group for which a nurse carries on all the public health nursing activities of the health department.

NATURE OF RECORDS USED

In order to obtain the desired information it was found necessary to supplement the records already in use. From the existing system of nursing records, it was not possible to obtain comparable data for all home visits.* For example, single communicable disease visits were not recorded on any record form giving information relative to the individual visited. Again, it was not possible to relate the nurses' home visits made in the interest of getting school children's defects corrected to the number of children visited, because a definite record of visits was not kept on every individual school child's record card. For purposes of complete analysis of the nursing activities this information is just as important as that on the record of the individuals visited in the interest of tuberculosis control.

Accordingly, and with the assistance of the Milbank Fund's staff, a new and simplified record system was instituted by the health department in February, 1930, which made provision for recording comparable data for every home visit. These data include information regarding the source of first information about the case, the nature of the problem, date of visit, services rendered at the time of each visit, results, and the reason for termination of the case. In other words, they were intended to record answers to these questions: "Why did the nurse visit? What did she do, and what happened?" As a further aid to making data comparable, emphasis was given to the importance of uniformity in recording the content of the nurses' visits.

A family folder was already in use which contained nurses' records for all members of the family, but with the new record system all information concerning the family is filed in this folder, namely, social history, clinic records, nurses' records, and special reports. These are filed in the 8 district health stations where the clinics are held and the

* Two reasons for this were (1) a certain lack of uniformity in recording the content of the nurses' visits, and (2) the prevailing practice of the nurse not keeping a record of the single health education visit made as a health department representative other than including it in her daily summary report of the total number of visits made.

nurse has her office. With the exception of a family index card, no records are kept in the central office, the distances making decentralization of records far more satisfactory.† When a family folder is not "started," the comparable data regarding the single health education visits are recorded on call slips. The complete information from these call slips makes available certain data heretofore incomplete.

A comparison of the number of visits represented in the sample of records used for this report with the reports of the total visits made by all the nurses on the staff in the same 6 months is shown in Table I. Since the percentages of visits made to individuals in each age group are so similar, it seems reasonable to conclude that the sample adequately represents the distribution of visits according to problems and age groups.

TABLE I

COMPARISON OF SAMPLE OF RECORDS WITH REPORTS OF TOTAL VISITING BY ALL THE COUNTY HEALTH DEPARTMENT NURSES, ACCORDING TO NUMBER AND PER CENT OF VISITS TO CASES IN EACH AGE GROUP
(February 1 to August 1, 1930)

Age Group	Number of Visits		Per Cent of Visits	
	Sample of Records	Reports of Total Visiting	Sample of Records	Reports of Total Visiting
Infant	240	1,422	16.4	15.4
Preschool	327	2,425	22.4	26.3
School	571	3,033	39.1	32.8
Adults	232	1,655	15.9	17.9
Maternity	89	702	6.1	7.6
TOTAL	1,459	9,237	99.9	100.0

THE EXTENT AND NATURE OF HOME VISITING

The indication afforded by our sample as to the extent of certain phases of the work done by generalized public health nurses in home visits in a rural area is summarized in the following tables and comments.

Assuming that the sample of data showing 1,459 visits to 733 individuals represents the ratio of individuals visited to visits made, it is estimated that 1 individual is visited for every 2 visits. Applying this ratio to the 9,237 visits recorded in the reports of the total work, it is estimated that 4,618 individuals or approximately 9 per cent of the

† A family folder index card containing a minimum amount of information is filed in the central office. This is sufficient to permit clearance of cases with the social Confidential Exchange and facilitate transfer of a record if a family moves from one district to another in the county.

TABLE II

DISTRIBUTION OF FAMILIES ACCORDING TO STANDARD OF LIVING

Standard of Living	Number	Per Cent
Well-to-do	8	2
Comfortable	50	12
Moderate	199	49
Poor	113	28
Very Poor	35	9
TOTAL *	405	100

* Excluding 21 families for which standard of living was not recorded.

total population* were visited by the county department of health nurses in 6 months. This probably means that the nurses visit about 14 per cent of the population in a year although later studies of the total year's work may modify this figure. This refers to the number of persons who received *any* home visit or visits from the public health nurse, regardless of the problem or several different problems occurring during a given year. The usual reports of official organizations do not give information regarding the per cent of the population receiving public health nursing service.

The economic status of the people visited is indicated approximately in Table II, which presents the nurses' classification of 405 families.

TABLE III

DISTRIBUTION OF 426 FAMILIES ACCORDING TO FREQUENCY OF VISITS BY 3 PUBLIC HEALTH NURSES IN 6 MONTHS

Number of Visits*	Families	
	Number	Per Cent
1	265	62.2
2	61	14.3
3	34	8.0
4	21	4.9
5	16	3.8
6	6	1.4
7	7	1.6
8 or more	16	3.8
TOTAL	426	100.0

* Total of 938 visits to 426 families.

* The preliminary 1930 census figures for Cattaraugus County, exclusive of Olean City, show a population of 51,246.

Table III, a tabulation of the frequency of nurses' visits to 426 families, shows that 62 per cent of the families received only 1 visit. Similar information is given in Table IV, showing the frequency of the visits to the individuals in these families. With the exception of the infant group, 50 per cent and over of all the individuals visited received but 1 visit in 6 months. In both instances, there are included families and individuals for whom service was begun toward the end of the 6 months' period, as well as those who had been receiving nursing visits prior to the stated period. Since the number of visits for a particular problem is not complete, this cannot be thought of as information pertaining to the nursing service as it relates to the particular family or case, but rather as a cross-section of the nursing service given by 3 nurses in a 6 months' period.

How the nurses happen to know about the people to be visited is shown in Table V, which is a tabulation of the source of first information about the cases visited. This information from our sample of records shows that 54 per cent were reports or requests from the official organization. These include reported cases of communicable disease, birth registration slips, and school reports of children with defects needing correction. It is to be expected that a large percentage of such information would come through official channels, but the records serve further to emphasize the selective influence of the organization machinery in determining what work is to be done. The small percentage of the nursing service originally sought or requested by individuals outside of official channels is a point for consideration in for-

TABLE IV

FREQUENCY OF THE HOME VISITS MADE TO INDIVIDUALS IN EACH AGE GROUP,
BY 3 PUBLIC HEALTH NURSES IN 6 MONTHS

	No. of Individuals Visited	Total No. of Visits	Frequency of Visits				Per Cent Distribution of Visits				
			1	2-4	5-7	8 or more*	Total	1	2-4	5-7	8 or more
Infants	75	240	29	29	10	7	100.0	38.7	38.7	13.3	9.3
Preschool	168	327	100	60	6	2	100.0	59.5	35.7	3.6	1.2
School	369	571	274	82	12	1	100.1	74.3	22.2	3.3	0.3
Adults	93	232	54	27	6	6	100.0	58.1	29.0	6.5	6.5
Maternity	28	89	14	7	3	4	100.0	50.0	25.0	10.7	14.3
TOTAL	733	1,459	471	205	37	20	99.9	64.2	28.0	5.0	2.7

* Individuals receiving more than 8 visits are distributed as follows: infant, one each 11, 16 and 19 visits; preschool, one 10 visits; school, one 9 visits; adults, one each 9, 10, 11, 16 and 19 visits; maternity, two 9, one each 14 and 17 visits.

mulating the health education program. An important phase of the family health work is indicated by the fact that 24 per cent of the cases visited first became known to the nurses through home visits to some other member of the family.

TABLE V

SOURCE OF PUBLIC HEALTH NURSE'S FIRST INFORMATION ABOUT 733 INDIVIDUALS VISITED IN HOMES

Source	In- fants	Pre- school	School	Adults	Maternity	Totals	Per Cent
Report from Health Department or Official Organization	33	51	279	23	1	387	54
Tuberculosis Bureau		1	13	17		31	
Communicable Disease Bureau		36	40	5		81	
Birth Certificates	28	6				34	
Child Health Conference	2	4				6	
Toxin Antitoxin Clinic		2	3			5	
Health Officer				1		1	
School Medical Service			166			166	
Teacher	1		36			37	
Social Service Department	2	2	13		1	18	
Director County Health Camp			4			4	
Public Health Nurse School In- spection			4			4	
Home Visit to Other Members of Family	35	66	43	19	6	169	24
Mother in Prenatal Period	30					30	
Mother in Prenatal Period for Sibling		19	13			32	
Maternity Patient				3		3	
Infant		14	8	2	1	25	
Preschool Child	3		2		4	9	
School Child	2	29		6	1	38	
Adult		4	20	8		32	
Request from Non-Official Individ- ual	1	20	20	19	8	68	9
Neighbor	1	19	20	11	4	55	
Member of Nursing Committee		1		8	2	11	
Telephone Operator					1	1	
Practical Nurse					1	1	
Patient's or Parent's Request	3	12	23	15	6	59	8
Physician's Request	1	9	4	12	7	33	5
Unknown	2	10		5		17	
TOTALS	75	168	369	93	28	733	
Total Known Classification						716	100

GENERAL TYPES OF HOME VISITS

In order to describe more clearly the work of the generalized public health nurse in an official health administration, it is desirable to

classify the home visits into some such categories as the following:

1. Single health education visits
2. Case visits
3. Bedside care visits

These categories may be defined thus:

Single Health Education Visit—This type of visit, peculiar to the nurse in the official organization, may be, for want of a better term, classified as the departmental call or the single health education visit made as a health department representative. It is illustrated by the single home visit made to a reported case of communicable disease, the 1 visit to an infant following the birth certificate report, or a visit to a school child to urge the correction of a physical defect.*

Case Visit—Case visits or the more or less intensive and repeated home visiting to disseminate health information and give health supervision for 1 or more members of the family, such as: the maternity case, visited several times in both the prenatal and postpartum periods; or the preschool child who presents nutritional and behavior problems; or the tuberculosis case and family contacts, all of whom require careful routine observation and supervision.

Bedside Care Visit—The visit in which bedside care is given at the time of illness, either in a case of emergency or to demonstrate to the family how to care for the patient.

The single home visit or departmental call is made necessary by the requirements of the health department program. If each nurse serves a population of 4,500, it is impossible for her to make repeated visits and give intensive health supervision to all cases with which she comes in contact. Since all types of visits were included in the sample of records collected, it was possible to make the analysis shown in Table VI, according to the amount of visiting to an individual. In this sample of records, 56 per cent of the individuals visited received single health education calls. This fact is sufficient evidence of the necessity for taking into full account this type of visit when studying the activities of the nurse in the official health department.

Since the sample of records used represents only a cross-section of home visiting for 6 months, an analysis as related to particular cases must of necessity be reserved until more complete data are collected.

* More than 1 visit might be desirable or ideal, according to accepted or proposed standards, for any one or many of the individuals in this group. It is impossible, however, for the nurse in the official health department to give continued supervision in the form of repeated home visits to all the individuals or patients with whom she comes in contact; therefore a selection is necessary. Several visits are, of course, made to some cases of communicable disease, to certain school children whose defects need correction, and to some infants whose birth certificate first informed the nurse of their existence; but the fact remains that there is a large group who receive only a single visit.

TABLE VI

INDIVIDUALS IN SPECIFIC AGE GROUPS, CLASSIFIED AS THOSE RECEIVING EITHER A SINGLE HEALTH EDUCATION CALL, OR REPEATED FOLLOW-UP VISITS FROM THE PUBLIC HEALTH NURSE

Age Group	Number of Individuals			Per Cent of Individuals		
	Receiving Several Follow-up Visits*	Receiving Single Health Education Visit†	Total	Receiving Several Follow-up Visits*	Receiving Single Health Education Visit†	Total
Infant	60	15	75	80	20	100
Preschool	80	88	168	48	52	100
School	124	245	369	34	66	100
Adult	37	56	93	40	60	100
Maternity	21	7	28	75	25	100
TOTALS	322	411	733	44	56	100

* As revealed by "case histories."

† As revealed by "call slips."

Our sample, however, throws some light on the sort of information that an analysis of records of this kind may yield.

There were 129 school children (in households where only school children were visited) who received a single home visit for the purpose of urging the correction of a physical defect found at the time of the school medical examination. The results of these visits are tabulated in Table VII. Subtracting from this total group the 26 instances where, as far as the public health nurse was concerned, the problem had been met, namely, "corrections had been made" (11), "children were receiving treatment" (6), "private physician or dentist had

TABLE VII

RESULT OF PUBLIC HEALTH NURSES' SINGLE HOME VISITS TO SCHOOL CHILDREN TO URGE CORRECTION OF PHYSICAL DEFECTS

Result	No. of Children	Per Cent
Corrections had been made	11	9
Children were receiving medical or dental treatment	6	5
Parents reported that physician or dentist had been consulted and said corrections were not necessary	9	7
Parents promised to have corrections made	55	43
Parents stated they could not afford to have corrections made	34	26
Parents refused to consider having corrections made	13	10
TOTAL*	128	100

* Excluding 1 child for whom result of visit was not recorded.

reported correction not necessary" (9), and the 1 case of unknown classification, leaves 102 instances of this problem. Of these, 34 or 33 per cent stated they could not afford to have corrections made. Since the nurse cannot usually offer free dispensary or clinic service, she is handicapped at this point, and a very definite problem is presented. This leaves 68 instances where the result of a single visit might be classified as successful or not successful, the former recorded as "Parents promised to have corrections made" in 55 or 81 per cent of the 68 cases, and the latter as "Parents refused to consider" in 13 or 19 per cent. If so considerable a proportion of parents were found to be non-coöperative, a definite problem in health education would present itself.

A similar kind of information is given in Table VIII in which are tabulated the results of public health nurses' home visits to preschool children for the purpose of urging protection against diphtheria by toxin-antitoxin. Of the 74 known as to classification there were 8 who had had the treatments, leaving 66 to be analyzed in terms of success or failure of the nurses' visits. If we consider the parents' promise to take the child either to clinic (29) or to private physician (7) as satisfactory, there were 35 or 53 per cent successful "results." The parents' refusal in 16 or 22 per cent might be classified as unsuccessful and the 15 or 25 per cent in which the parent promised to consider the matter as "cases to be followed up." In this instance the free toxin-antitoxin clinic eliminates the possibility of children not having protection against diphtheria because their parents cannot afford to pay for the treatments.

A comparison of the "results" in these two phases of the work shows that even with the facility for free treatment in the case of toxin-

TABLE VIII

THE RESULT OF PUBLIC HEALTH NURSES' HOME VISITS TO
PRESCHOOL CHILDREN TO URGE TOXIN-ANTITOXIN

Result	No. of Children	Per Cent
Child had had the treatments	8	11
Parents promised child would attend clinic	28	38
Parent promised to take child to private physician for treatment	7	9
Parent promised to consider the matter	15	20
Parent refused to allow child to have treatment	16	22
TOTAL*	74	100

* Excluding 7 children for whom result of visit was not recorded.

antitoxin there is a higher percentage of unsuccessful visits for "TAT" than for "correction of defects." This is to be expected, perhaps, since the toxin-antitoxin represents the newer phase of prevention as against the older idea of correction; but the fact suggests a specific direction in which further emphasis may be given in health educational work.

That all infants visited by the public health nurse received more or less of a certain routine service in the form of, (1) advice to the mother regarding the general care and feeding, (2) an invitation to attend the Child Health Conference, and (3) an explanation of the need for and value of preventive measures such as toxin-antitoxin, does not seem too great an assumption, but a more complete indication of the results of such service is given in a sample record of what the nurses actually accomplished. The records of 75 infants visited during the 6 months showed that only 25 per cent had attended the Child Health Conference, and 25 per cent had received toxin-antitoxin. Some of the infants may have received only a single visit from the public health nurse, at which time but one problem was discussed. Perhaps many of the infants who had not had toxin-antitoxin were only 1 or 2 months old, and some of those who had not attended the Child Health Conference may have been under supervision of private physicians. The point to be considered is the reason why a larger percentage of success was not possible, and this will be attempted later in a more complete analysis related to particular cases.

Another type of visit which is influenced by the official organization is that in which bedside care is given in illness. This type of service is not included in the program of many official organizations, but in the rural sections of Cattaraugus County, where there are no

TABLE IX
HOME VISITS BY PUBLIC HEALTH NURSES TO GIVE BEDSIDE CARE

Age Group	Number of Individuals Visited	Total No. of Visits	Distribution of Visits		
			1	2-4	5-7
Infant	7	24	3	1	3
Preschool	7	7	7		
School	9	11	8	1	
Adult	20	88	11	4	5*
Maternity	6	16	3	2	1
TOTAL	49	146	32	8	9

* One had 16, one 19 and one 21 visits.

other agencies to which cases can be referred, the County Health Department offers bedside care either in a case of emergency or as a demonstration to teach the family how to care for the person "sick in bed." In the sample of records analyzed, the number of individuals who received bedside care (49) represents 7 per cent of the total visited, and the number of visits (146) for this purpose, 10 per cent of the total visiting. Table IX shows the number and distribution of visits.

TABLE X
DESCRIPTION OF BEDSIDE CARE GIVEN TO 20 ADULTS

No. of Adults	Condition or Need for Care	Actual Service Given at Time of Home Visits	Total Number of Visits
		<i>One demonstration visit to teach a member of the family to give care:</i>	
5	Old Age—Bedridden	Gave bath, made bed, made patient comfortable. Demonstrated care necessary to prevent bed sores.	5
2	In Automobile Accident	Gave bath, applied wet dressing to cuts and bruises as per physician's orders.	2
2	Erysipelas	Gave bath, applied dressing to affected areas, demonstrated isolation technic to practical nurse who was caring for the patients.	2
1	Injured Finger	Applied first aid dressing to finger.	1
1	Measles	Gave bath, changed bed, made patient comfortable and demonstrated isolation technic. <i>More than 1 visit, emergency situations. No adult in home to care for patient:</i>	1
1	Tonsillitis	Swabbed throat.	2
1	Acute Intestinal Disturbance	Gave bath, made patient comfortable.	2
1	Nephritis	Gave bath, prepared special diet ordered by physician.	3
1	Old Age—Heart Condition	Gave bath, changed bed, made patient comfortable, took pulse and temperature, reported condition to physician.	4
1	Old Age—Paralysis	Gave bath, made patient comfortable (patient moved to hospital).	5
1	Pneumonia	Gave bath, applied pneumonia jacket, took temperature and reported to physician.	5
1	Cystitis	Gave bladder irrigation.	16
1	Tuberculosis	Gave bath, changed bed, sterilized dishes (advanced case).	19
1	High Blood Pressure	Gave general hot pack (lasting one hour).	21
20		TOTAL	88

Adults constituted over 40 per cent of the individuals who received this type of service, and to illustrate the possibilities of drawing a more intimate picture of the work, a description of the actual services rendered to these 20 adults is shown in Table X.

SUMMARY

The increasingly important part which the public health nurse is taking in all of the activities of the official health department organization is sufficient evidence of the need for careful analyses of the nature of her work, appraisals of its results, and a critical consideration of the directions in which it can develop most fruitfully.

The necessary records for such a consideration are not ordinarily available in the purely administrative reports. Without adding to the burden of record keeping, the nurses' reports can be revised in such a way as to make the desired information available.

In the course of certain studies of the work of the official public health nurse, a preliminary consideration of a sample of records from Cattaraugus County, representing the actual experience in home visiting of approximately the equivalent of 3 nurses for 6 months, suggests the usefulness of records of this kind. It was indicated that:

The nurses make home visits to 9 per cent of the total population in 6 months and probably about 14 per cent in a year.

Only 1 visit was made to 62 per cent of the families.

For 54 per cent of the people visited, reports or requests for visiting came through official channels, illustrating the selective influence of the organization machinery. In 24 per cent of the cases the individual was first known to the nurses by reason of visits to other members of the family.

The so-called single health education visit is made necessary by the requirements of the official health department program. Of the individuals visited 56 per cent received single health education calls.

An adequate, though simple, record of the "results" of home visits reveals the nature of problems to be attacked by the health department. For example, it was found that in 23 per cent of cases visited for correction of defects the family stated that they could not afford to have the corrections made, thus suggesting a problem in economics. About 20 per cent of the cases revealed uncoöperative families, suggesting the need for further health education.

The precise character and extent of the bedside care given by rural public health nurses can be depicted by adequate records of what is done in such instances.

REFERENCES

1. Mustard, H. S., M.D. *Cross-Sections of Rural Health Progress*, The Commonwealth Fund, Division of Publications, New York, p. 10.
2. Seventh Annual Report (Cattaraugus County Department of Public Health): *Public Health in Cattaraugus County, 1929*, p. 63.

Fiji Carries on for the Children

FIJI Island mothers staged a child-welfare meeting at the Agricultural Show held last year in Suva, Fiji, according to a report by Dr. Regina Flood-Keyes Roberts, the wife of the American consul at Suva. Dr. Roberts carries on volunteer child-welfare work in the vicinity of this capital of a British possession. She reports that two Fijian students at the Central Medical School are now being trained by her for the work, accompanying her on her rounds of the villages. Senior students are also invited to go with her on these visits. A student trained last year was, on graduation, assigned a district, and he is reported to have been doing good work.—U. S. Children's Bureau, Washington, D. C.

Diphtheria Prevention in Detroit*

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THE question of diphtheria prevention in Detroit is a very serious one, for we have today the highest diphtheria death rate of any large American city. Detroit started its diphtheria prevention work in the year 1921 by offering diphtheria protective treatments, in the schools, to those children whose parents would consent to have them protected.

There was a gradual increase in the number of children protected, mostly school children, until the year 1926 when there was a very pronounced rise. This increase was due primarily to two reasons—(1) More money was spent upon diphtheria prevention that year, with the establishment of a large number of clinics. (2) This was a year of high incidence of diphtheria and a very serious form of the disease made its first appearance.

There was a pronounced drop in the number of immunizations against diphtheria in 1927 and a further drop in 1928. This falling off in number of children protected may be attributed to two factors—(1) The high incidence and severe diphtheria of 1926 having passed, the scare was over and people began to lose the fear of the disease which had been aroused during the preceding year. (2) The most easily reached portion of the population had already had their children protected. We were beginning to run into that group of parents which is more difficult to rouse to action.

In the year 1928 it was felt that sufficient educational work had been done on diphtheria prevention to warrant placing the entire responsibility for giving diphtheria preventive treatments and the Schick test in the hands of the practising physician where we believe it rightfully belongs. The details of the plan and how it is working out will be described.

In view of the fact that the plan of turning over to the physician the responsibility for diphtheria prevention is only part of a definite

* Read before the Health Officers Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 29, 1930.

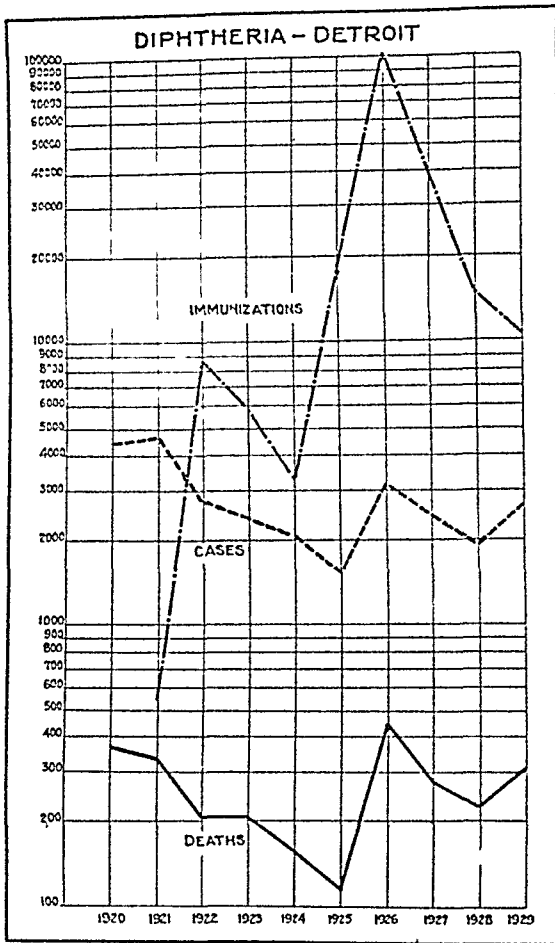


FIGURE I

policy to which we hold, it may be wise to digress for a moment and describe this policy.

If we agree that the goal toward which we are aiming is universal participation in procedures of preventive medicine and health promotion, then some group or groups of individuals must be prepared and ready to meet the demand for service which this goal would entail. To put it more simply, if we expect all persons, young and old, to do the things which we think they should to prevent disease and maintain good health, the services indicated will have to be supplied by some group or groups of individuals. It is our contention that it is unreasonable to expect any large reasonably well-to-do community itself to supply sufficient funds and personnel

to provide all the services necessary to insure universal participation in the field of preventive medicine and health promotion. From whom then can these services be obtained, except from the private physician, dentist, nutritionist, psychiatrist, etc.? If these hypotheses are well founded the official health organization has two important functions to perform.

1. To create a demand on the part of the people of the community for well proven scientific procedures of preventive medicine and health promotion.
2. So to cooperate with the medical and dental professions that the services will be adequately provided when the demand arrives. This means in effect that the health organization must take the message of preventive medicine and health promotion to the practising physician and dentist to the end that they may become better able, willing and anxious to participate in this type of work.

The diphtheria prevention program in Detroit is in keeping with this policy. Having carried on clinics for diphtheria protection continuously for 8 years we felt that the value of this service had been well demonstrated. The majority of the people in the community had

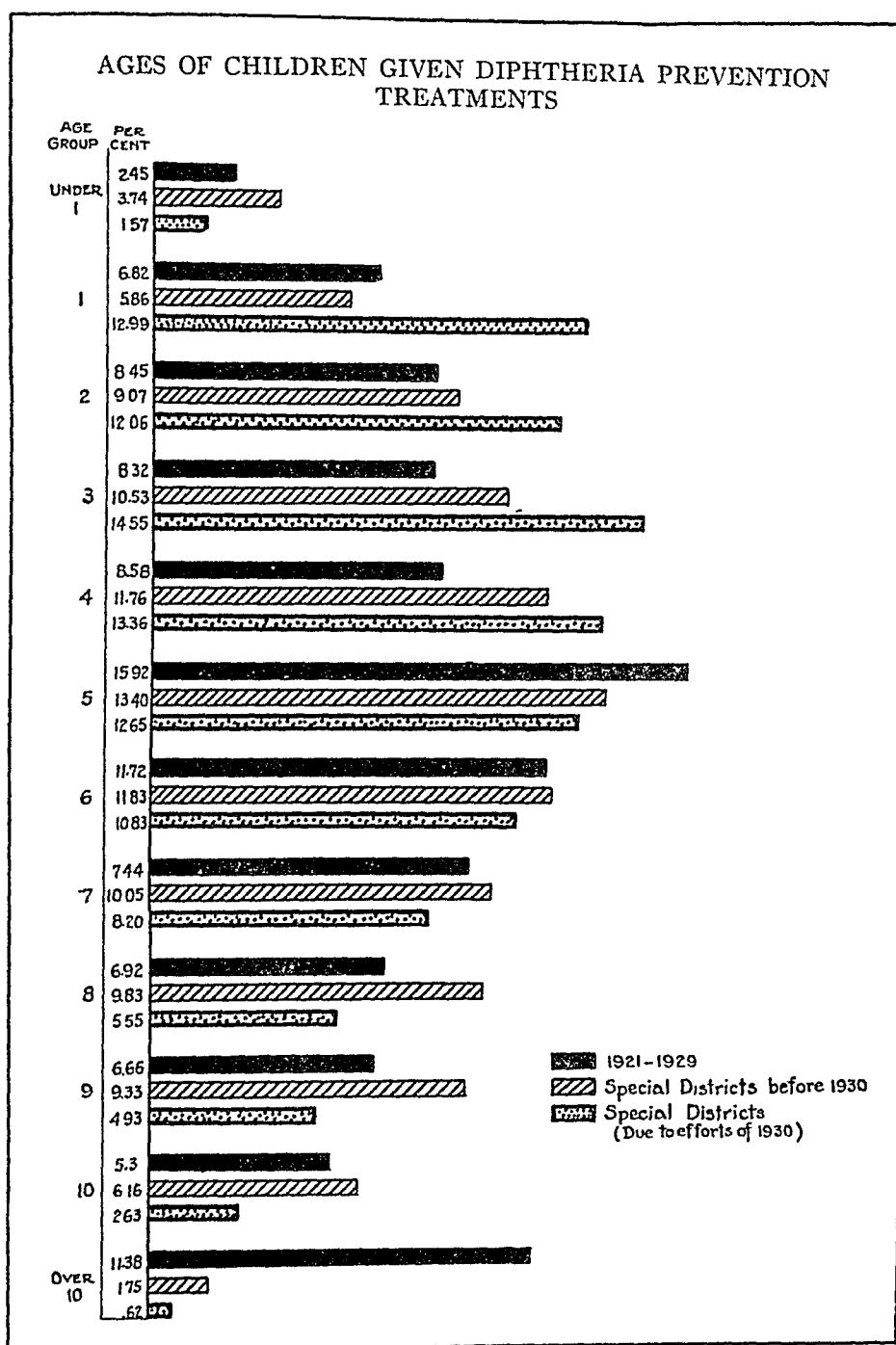


FIGURE II

learned that diphtheria is a definitely preventable disease and that the means of obtaining protection is simple and harmless.

During the summer of 1928 a coöperative plan was worked out between the Department of Health and the local medical society whereby, beginning in October, 1928, the physicians of the city agreed to give all diphtheria prevention treatments and Schick tests. The physicians also agreed to sign for toxin-antitoxin and Schick material

taken from stations (the Department of Health established 8 stations from which these materials could be obtained day or night), and to report work done. Postal cards upon which the Department of Health would pay the postage were supplied for this purpose. There are two types of card, one for the Schick test and the other for toxin-antitoxin. The physician is asked to take from the station at which he receives his material the same number of toxin-antitoxin postal cards as he takes c.c. of toxin-antitoxin in order that each dose may be reported separately.

At first thought it would seem expensive and unnecessary to have a separate report for each dose given but it was felt, after discussing the matter with a good many physicians, that more complete and accurate reporting would result if the physician could merely write on a card the name of the child, address, age, and check the dose given, drop the card in the mail and forget about it until the next dose, rather than that he should be asked to keep record of the doses and report at the end of the series of treatments.

In the original plan of 1928, the physicians agreed to give diphtheria prevention treatments for a reasonable fee or free of charge to those unable to pay.

For its part, the Department of Health agreed not to give any toxin-antitoxin or Schick tests; but to carry on the educational propaganda necessary to give impetus to the work—news stories, paid advertisements, posters, lectures, radio talks, and the distribution of literature; to distribute toxin-antitoxin and Schick material and postal cards upon which reports could be made; to keep records of work done; and to reimburse physicians at the rate of \$.50 per injection of toxin-antitoxin or \$1 for the Schick test for work done for patients unable to pay.

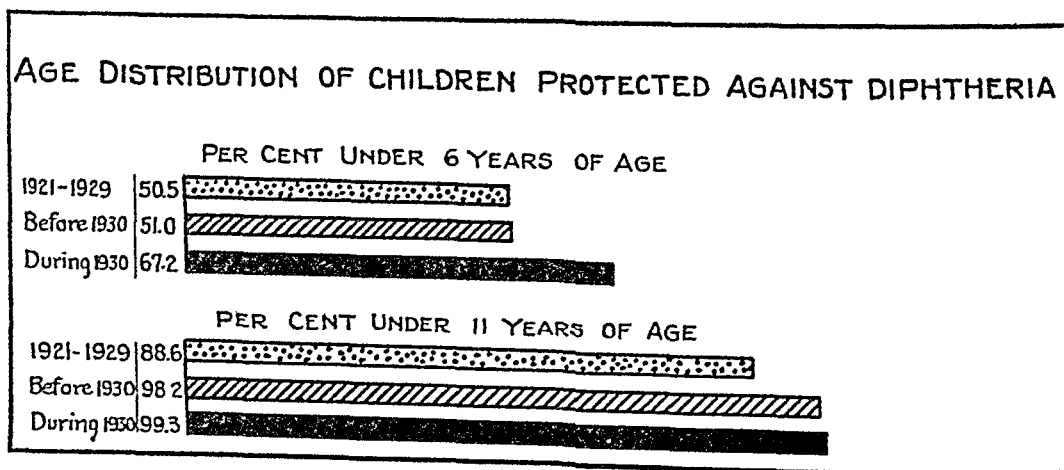


FIGURE III

This, then, was the plan in 1928. Certain mistakes were made at that time which have since been rectified. For example, in the original program the medical society pledged the physicians of the city to the agreement and all physicians were given written notice of the agreement and plan but only a comparatively small number of them were actually seen and talked with concerning it. The result was that many physicians did not know the details of the plan, except as they may have read it in the letter which was sent them, and probably many of them did not even read it, and not being familiar with it were not entirely in sympathy.

During this first year of the program, children were sometimes referred to physicians who did not believe in diphtheria protection and in some instances they got into the hands of physicians who charged exorbitant fees. While such instances were not especially numerous, they did mitigate against the success of the program. We (that is the Department of Health and a small group of influential and prominent members of the local medical society) were deluded into thinking that we had "sold" the idea to the medical profession as a whole, when as a matter of fact only a small percentage of the physicians of the city knew much about the plan. It is only human nature for an individual to be against a program about which he knows little or nothing.

With the conviction of this error in mind—and this error is, by the way, the one most commonly made in attempting coöperative programs with the medical profession—in 1929 a letter was sent to each physician of the city asking whether he cared to coöperate in the diphtheria prevention program. If he agreed he was asked to fill out a questionnaire, which was enclosed with the letter, and return it to the Department of Health.

As an immediate response to this letter, approximately 700 physicians signed the questionnaire indicating their willingness to accept children for diphtheria protection, at certain hours specified by them, for \$1 per dose or free of charge for all those unable to pay. Since the original letter, the number of coöperating physicians has grown to nearly 900, which represents approximately 85 per cent of the total number of physicians in the city who might be in a position to participate actively in diphtheria prevention work.

In spite of the fact that the plan had been presented in detail in writing and that each physician had signed a written agreement to participate actively in the program, we nevertheless realized the necessity for having personal contact with as large a number as possible. Accordingly we took every opportunity of addressing meetings of medical groups. Not only was the local medical society itself addressed

QUESTIONNAIRE

If you are interested in the continued abolishment of free diphtheria prevention clinics, please read this notice.

Physicians' Diphtheria Prevention Campaign

Name Telephone

Address

Regular Office Hours: A.M. from to Special Diphtheria Day

P.M. from to

Mon. Tues. Wed. Thurs. Fri. Sat. Sun.
(Please check day set aside)

Hours from to

..... to

In order to help wipe out diphtheria, I agree to administer 3 injections of toxin-antitoxin in my office for the following fees:

I will set aside special hours day a week (as noted above) for toxin-antitoxin injections, charging for each such injection during those special hours a fee of \$1.00.

If I cannot set aside special hours for toxin-antitoxin injections, I am willing to give the injections during my regular office hours at a rate of \$1.00 for each injection of toxin-antitoxin.

Be sure to designate clearly the day or days and hours during which you will be willing to accept patients for toxin-antitoxin and Schick tests

I further agree to immunize such children whose parents cannot afford to pay for such service, free of charge to them. For such service, upon receipt of proper statement, the Department of Health agrees to reimburse me at the rate of \$.50 for each injection of toxin-antitoxin and \$1.00 for the Schick test including its reading.

I consent to the inclusion of my name in a list of doctors who, as an additional contribution to public health, agree to administer toxin-antitoxin for the above fees. This list is to be used by the Health Commissioner, or the Wayne County Medical Society, or others designated by them, for the purpose of directing parents who are not attached to regular doctors and to encourage those who can pay for their medical service to do so.

I further agree to sign for all toxin-antitoxin and Schick test material taken and to make report to the Department of Health on use made of it on post cards provided for this purpose.

Date Signed M.D.

P.S. Failure to receive word from you will be assumed to indicate that you do not care to have your name included among those coöperating in the Diphtheria Prevention Campaign.

*The Public Health Committee of the Wayne County Medical Society
coöperating with the Detroit Department of Health*

(Use Other Side for Any Comment)

on diphtheria prevention, but short talks on the subject were also given at several successive meetings of each of the branch medical societies.

Advantage was also taken to present the subject at hospital staff meetings. In addition three separate meetings were held to which the coöperating physicians were invited. These meetings were held at our own hospital and refreshments were served. At each meeting the plan was discussed in detail and changes made in accordance with sug-

gestions received. The Schick test was demonstrated and a number of children, who had been Schicked, were present to permit reading of the test. In all, about 260 of the 700 coöperating physicians (there were 700 at that time, there are now about 900) came to one or another of these meetings.

In 1930 arrangements were made for a large series of neighborhood meetings in which one physician invited ten or a dozen of his colleagues in the neighborhood to come to his house or office to discuss plans for greater participation on the part of the practitioner of medicine in the field of preventive medicine and health promotion. A definite and carefully worked out program with clinical material for demonstration was presented at each of these meetings. It is our belief that some such system as this is the only feasible means of bringing about effective participation in the field of preventive medicine and health promotion on the part of physicians in urban communities pending the time that these subjects are more adequately taught in medical schools.

This, then, without going into too great detail, is the policy of diphtheria prevention which is being carried on in Detroit today. Perhaps even more encouraging than the actual results of the program to date is the attitude of that group of physicians who have been most closely associated with the plan. This group has shown not merely an interest but a very enthusiastic active interest in diphtheria prevention and in the entire field of public health.

What have been the results and what do we hope eventually to accomplish?

Beginning in 1921, diphtheria protection was given in schools to those children whose parents were willing to have them protected. In spite of the fact that diphtheria was high that year, only a few children were immunized, as might be expected, for long time protection against diphtheria was at that time a relatively new thing to the public. This same program of giving diphtheria prevention in schools was carried on through the year 1925 with gradual increases in the number of children immunized. In 1926, diphtheria became unusually prevalent and much of it was of a very severe type.

In that year the Department of Health not only carried on its work in the schools but also opened 18 free clinics in strategic parts of the city and launched an extensive publicity and advertising campaign. People were frightened and the number of immunizations rose to 106,000, the largest number to be protected in any single year. It is interesting to note that during the next year, 1927, with diphtheria far less prevalent but with the same number of free clinics and with an equal, if no greater, expenditure of funds and effort devoted to pub-

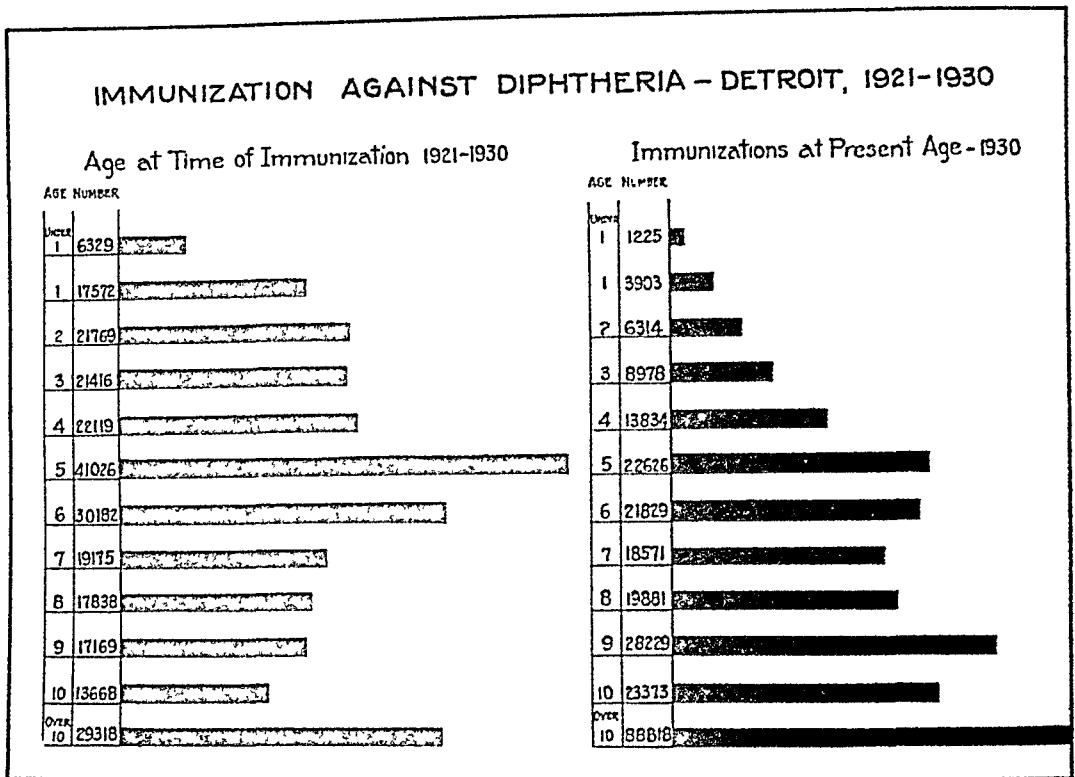


FIGURE IV

licity and advertising, the number dropped to 38,800, only slightly more than one-third the number immunized during the preceding year. There was a still further drop in numbers protected during 1928.

In the fall of 1928, the present plan of having all the work of giving diphtheria preventive treatments and Schick tests done by the practising physicians was instituted. We have already pointed out some of the mistakes that were made at the inception of the plan, and the methods by which we have attempted to correct them. Numbers protected during the first two years of this program were not great but in 1930 the number protected exceeded 50,000, which is the greatest number reached in any year except 1926, when diphtheria was unusually prevalent and severe.

The increase in numbers protected in 1930 may be attributed principally to two factors: (1) A thoroughly awakened interest on the part of the physicians of the city to have children protected against diphtheria, and (2) a change in method of persuading parents to have their children protected. The increased interest on the part of physicians is due to the fact that an ever increasing number of them are becoming thoroughly familiar with and, therefore, sympathetic toward the program.

The year 1930 saw a decided change in the method of persuading parents to have their children protected. From 1921 through

1925, diphtheria prevention was undertaken only in the schools and most of the children reached were of school age. Notices were sent home to parents asking permission to immunize their children, but no extensive publicity campaign was carried on. In 1926 and from that time on, increasing emphasis was placed on the necessity for having preschool children protected. From 1926 through 1929, a very extensive publicity and advertising campaign was in operation. It may be well, at this point, to differentiate between a diphtheria prevention program and a publicity and advertising campaign. Our program for protecting children against diphtheria is a continuous one, going on throughout the year and from year to year. Publicity and advertising campaigns, on the other hand, are carried on for short periods of time, usually in the fall, to give impetus to the work of diphtheria prevention.

Publicity and advertising include news stories, paid newspaper advertisements, outdoor bill boards, posters in street cars, stories in foreign language and neighborhood papers, moving pictures, lectures, radio talks, and the distribution of literature on the subject. Pamphlets are distributed through schools, clinics, meetings, and are also enclosed with birth registration certificates. When a child reaches 6 months of age its parents are sent a letter advising immunization against diphtheria.

These intensive publicity and advertising methods succeed in arousing a certain group of the population to definite action. Children of parents in this group have, for the most part, been protected as a result of these publicity methods. There is another large group of individuals (whether this group is larger in Detroit than elsewhere we have no way of knowing, but it is in any event a large group) who cannot be aroused to action through the generally accepted channels of publicity and advertising.

In an effort to reach this group effectively, two rather large districts of the city in which diphtheria had been unusually prevalent and severe (the two districts comprising 18.3 per cent of the city's population had, in 1929, a total of 26 per cent of the city's diphtheria cases and 31 per cent of the deaths) were selected for an intensive house-to-house canvass by public health nurses, the object of which was to secure the immunization against diphtheria of children between the ages of 6 months and 10 years. This work was carried on during the summer of the present year, 1930. An average of 45 nurses devoted their entire time for 2 months to this project. So encouraging were the results (in all 62.57 per cent of the children whose parents were interviewed in those districts are now protected against diphtheria or

rather have completed their series of diphtheria prevention treatments) that it was decided to continue and enlarge this type of work.

In order to permit the enlargement of this project it was decided to postpone certain phases of health work that could be temporarily postponed in order to release personnel for diphtheria prevention work. The city was divided into 15 large districts (exclusive of those districts in which intensive work had already been carried on), and 112 nurses were assigned to diphtheria prevention work in these districts. This project commenced on October 20 and for the next 4 months these nurses devoted their efforts toward securing the immunization of all children between the ages of 6 months and 10 years. They called in all homes throughout the city where there were children of this age group. Coincident with this actual interviewing of parents the usual publicity and advertising were carried on.

One of the daily newspapers sponsored a diphtheria prevention poster contest in which the Department of Health purchased the three winning posters for use in the diphtheria prevention program. Posters were judged not on artistic merit alone but also on their ability to portray diphtheria prevention. In order to make the nurse's interview as effective as possible, each nurse has been provided with not only a set of instructions as to the mechanical means by which the work is to be carried on, but also with a little pamphlet entitled "Questions and Answers," which answers the questions commonly

TABLE I

DETROIT'S PRESENT STATUS OF DIPHTHERIA PROTECTION

Ages	Detroit's 1930 Population	Original Ages of Children Protected		Present Ages of Children Protected	
		No.	Per cent	No.	Per cent
Under 1	30,063	6,329	21.0	1,225	4.07
1	32,424	17,572	54.1	3,903	12.03
2	32,738	21,769	66.4	6,314	19.28
3	33,525	21,416	63.8	8,978	26.78
4	34,155	22,119	64.7	13,834	40.50
5	32,424	41,026	126.5	22,626	69.78
Total Under 6	195,329	130,231	66.6	56,880	29.12
6	31,007	30,182	97.3	21,829	70.40
7	32,266	19,175	59.4	18,571	57.55
8	30,063	17,838	59.3	19,881	66.13
9	29,276	17,169	58.6	28,229	96.42
10	29,118	13,668	46.9	23,373	80.26
Total Under 11	347,059	228,263	65.7	168,763	48.62
Over 10		29,318		88,818	
Total		257,581		257,581	

asked about diphtheria protection, and a sheet of instructions for a "sales" talk on the subject. The slogan emphasized in all publicity and advertising was "Children Need Not Have Diphtheria." All correspondence of the Department of Health was stamped in red letters bearing this caption.

We have already shown the number of immunizations which were effected in each of the years since 1921. Starting with only 579 in 1921, the numbers increased to a high point of 106,000 in 1926, fell off again and reached a second high point of over 50,000 for 1930.

The changes in age distribution of children protected are interesting and significant.

To summarize very briefly, it is our opinion that the program of having the private practitioners of medicine give diphtheria prevention treatments has a number of distinct advantages over the method of having this work done in schools or clinics.

1. The policy is in keeping with the average American's desire to choose his own grocer, his own clothing and his own physician.

2. It tends to place the responsibility, for that particular phase of child health at least, in the hands of the parent where we believe it rightfully belongs.

3. It makes a substantial beginning in attaining the goal toward which we are aiming: a greater degree of participation on the part of the private practitioner of medicine in the field of preventive medicine and health promotion.

4. It has a cumulative educational effect on both patient and physician which does not obtain in the clinic system. For example, if in the immunization of 50,000 children by private physicians we have created even as few as 2,000 new contacts between family and physician, which contacts become enduring, and the physician becomes the family health adviser, we will have accomplished something of far more reaching effect than the immunization of 50,000 children against diphtheria, important as that is.

5. This system seems to result in the immunization of a larger percentage of the most susceptible age group, the preschool child.

Newer Knowledge on Botulism and Mussel Poisoning^{*}

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SINGLE or group intoxications due to the ingestion of the toxin generated by *Cl. botulinum* and *parabotulinum* in various articles of food continue to be reported. With the exception of the annual reviews published in the *Journal of the American Medical Association*,¹ no statistical data have appeared on the subject of botulism since 1922.² It may therefore be of interest to review briefly some of the data collected during the past 10 years. In Table I the annual distribution of botulism is summarized.

In this connection it must be pointed out that no claim for completeness can be made on account of the well known fact that inquiries instituted in the course of the investigation of an outbreak of food poisoning not infrequently elicit histories of similar occurrences which have taken place in the same community or vicinity several years before. Unfortunately, botulism is only reportable in 13 states (Arizona, California, Colorado, Connecticut, Idaho, Kansas, Maryland, New York, Minnesota, Oregon, Washington, West Virginia, and Wyoming. Single cases, or intoxications, only superficially studied by a coroner's department may be due to the ingestion of botulinus toxin, while reports of such cases have been given as due to botulism on insufficient evidence. Complete data on this disease are therefore not available.

For a number of years, particularly during 1926-1927, few authentic cases of botulism were reported, largely due to the after-effects of the flood of publicity which called attention to the possible danger inherent in inadequately sterilized or preserved, especially home-canned, food products. During the past 2 years, a definite increase has been noted and group intoxications involving 5 to 12 cases have again made their appearance. As a whole, people who could probably

^{*} Read before the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

TABLE I
SINGLE AND GROUP INTOXICATIONS DUE TO BOTULISM
1899-1930

	Home preserved		Commercially preserved		Unkn own	Total
	Bacteriology proven	Bacteriology not proven	Bacteriology proven	Bacteriology not proven		
1899-1909	—	3	—	—		3
1910		2		1		3
1911	0	0	0	0	1	1
1912	1	2	0	2		5
1913	0	3	0	1	1	5
1914	1	1	1	0		3
1915	2	2	0	3	1	8
1916	3	2	0	0	2	7
1917	3	4	0	2		9
1918	3	9	0	1	1	14
1919	0	9	3	2	2	16
1920	1	3	4	2	1	11
1921	4	4	5	4	1	18
1922	11	6	1	1	4	23
1923	4	7	0	0	3	14
1924	4	4	2	2		12
1925	2	1	3	2	1	9
1926	1	2	0	0	0	3
1927	4	1	0	0	0	5
1928	3	3	0	0		6
1929	3	6	1 (Italian)	0	1	11
1930 (Sept. 30th)	0	5	0	0	—	5
Total	50	79	20	23	19	191

never be reached by any method of warning have been the victims of their own ignorance. With the exception of 2 cases of botulism traced to shalots (*Muscari commosum*) packed in Italy, home preserved vegetables, fruits, fish, and meats have been the products responsible. Commercially preserved food has not been connected with any of the recognized cases of botulism since 1925. Scientific canning procedures have replaced empiricism in practically every branch of the industry which packs products liable to botulinus spoilage. In the very near future, every type of food which is preserved by canning will either be subjected to such sterilization times and temperatures or to such processes of acidification and curing that the toxicogenic anaerobe will either be destroyed or its growth completely inhibited. Continuous vigilant supervision and far reaching education have been responsible for the removal of the botulinus menace from the commercial packing industry. The fundamental studies which enabled the industry to

apply scientific principles to the control of botulism have been published in a series of papers.³

The 191 single or group intoxications, collected over a period of approximately 30 years, involved a total of 625 people with 411 deaths. The case mortality rate has risen from 61.7 per cent in 1922 to 65.7 per cent in 1930. This exceedingly high rate is only surpassed by the figures (67.3 per cent) reported by Zlatogoroff and Soloviev⁴ for the fish poisoning cases due to *Cl. botulinum* in Russia. The average mortality of the German mass intoxications, with the exception of 3 instances in which home-canned string beans were responsible, has remained approximately 20 per cent. These differences may be due partly either to the low toxicogenic properties of the non-proteolytic *Cl. botulinum* Type B, or to the nature of the foodstuffs involved in the intoxications. The moisture in the causative food is doubtless an important factor. The high mortality in the American string bean group intoxications finds its analogue in the fatality rate of the German vegetable poisoning cases reported by Landmann, Blumer and Wagner.⁵ Meat and fish products with a high water content, in the form of pastes, soft sausages of the mettwurst variety, pickled fish, etc., have caused a higher mortality than hams or other relatively dry pork products in which the poison is unevenly distributed. Since approximately 88 per cent of the intoxications observed in the United States are caused by vegetables of various sorts preserved in brine, the possibility of ingesting a fatal quantity is considerably greater than in Germany where hams are the chief botulinogenic foods. Heat preserved canned foods are responsible for less than 5 per cent of the German botulinus intoxications.

As a rule the provisional diagnosis of botulism has been made without any difficulty, but it is noteworthy that the accuracy of the findings has only been confirmed by bacteriological tests in one-third of the observations. Attempts to determine the true nature of the poison doubtless have been made, but only too often the causative food either has been completely consumed or the remnants have been destroyed or discarded. In a few instances the clinical records have been confirmed by the demonstration of botulinus toxin in other containers of the same pack or the coincident occurrence of botulism in chickens.

The geographical distribution of the American outbreaks has changed only slightly. The rural sections of the western states (California, Washington and Colorado) continue to furnish the bulk of the observations. It is of interest that New York, with 10 single or mass intoxications, has taken 4th place, while such states as Oregon,

Idaho, Montana, North Dakota and Wyoming have recently contributed their share to the botulinus statistics. The data are in many ways interesting but it is here merely pointed out that botulism cases may be found with equal frequency in the eastern states provided an effort is made to investigate the distribution more carefully than has generally been the case.

The spores of *Cl. parobotulinum* are in the soil throughout the United States, England,⁶ Germany, and France,⁷ and have recently been demonstrated in specimens of mountain dirt collected from shalots in Southern Italy. In the light of the observations made in South Africa and of the findings reported by Kempner and Pollack⁸ many years ago, it is not unlikely that certain varieties of the botulinus group (non-ovolytic *Cl. botulinum* Types B, C and D) lead a saprophytic existence in the intestinal canal of animals, as, for example, in hogs. Fecal and not soil contaminations may, therefore, confer on the food the dangerous botulinogenous properties.

The rather frequent occurrence of these varieties of *Cl. botulinum* in the bone marrow of cattle, lamziekte or hogs (the growth of spores in the marrow with diffusion of the poison through the foramina), lends considerable support to the interpretations of the few carefully studied observations. A search for non-ovolytic botulinus Types B and D in manure remains, however, futile until a selective enrichment medium has been devised. In this connection, it is recalled that the non-ovolytic Type C has been found in the United States but so far has not been connected with human cases of botulism. In all probability this is due to the fact that the toxin must be ingested in large quantities in order to cause intoxication in man. Type D has been isolated in South Africa and it is claimed that Types A and B are unknown in that country.⁹ The Van Ermengen B strains have not, as yet, been found in the United States. The examination of many thousands of samples of soil, sewage, manure, etc., of American origin has never furnished indication of botulinus toxin producing anaerobes which resemble these Van Ermengen strains. Notwithstanding these negative findings it is not safe to conclude that the bacillus is not present on the North American continent. It is highly desirable that the ecological studies on the botulinus organism begun many years ago be continued in order to establish more conclusively the genetic relationship of the Types A, B, C and D.

In Table II the foods proved to be responsible for the 192 outbreaks are briefly summarized. Plant products were involved in 72 per cent of the cases, while 18 per cent of the outbreaks must be attributed to animal products. Home-canned string beans continue to

play a very important rôle, largely due to the well known fact that spoilage of this vegetable when preserved is so slight that the housewife or cook will often fail to detect it. Furthermore, string beans are frequently served as salads and any odor which might arouse suspicion is usually masked by the vinegar or mayonnaise dressing. Home-canned corn has also been a frequent offender.

Occasionally the monotonous character of these intoxications is changed by the occurrence of an observation in which an article of food rarely connected with botulism is a carrier of the deadly toxin. Plant or meat products supposedly immune from botulism spoilage have recently been definitely associated with fatal cases. Invariably the article of food was improperly preserved, that is, either under-processed or inadequately acidified. The factors responsible for the spoilage in Bartlett pears by *Cl. botulinum* have been studied." It has been demonstrated that *Cl. parobotulinum* may generate and

TABLE II

FOODS INVOLVED IN OUTBREAKS OF BOTULISM, 1899-1930 (OCTOBER)

String beans	50	(3 commercially packed, not proven)	Green tomatoes	1	(home canned)
Corn	22	(1 commercially canned) (1 commercially packed, not proven)	Squash	1	
Olives	14	(13 commercially packed) (1 home canned)	Turnips	1	
Spinach	12	(9 commercially packed, 4 proven direct, 1 indirect)	Pickles	1	
Asparagus	9		Apricot butter	1	
Beets	5	(2 commercially packed, 1 proven indirectly)	Peas (?)	1	(commercially packed, not proven)
Apricots	3		Persimmons	1	
Pears	3		Shallots, Muscari	1	(commercially packed in Italy)
Chili peppers	3			141	
Figs	2		Pork products	10	
Celery	1		Sea food	7	(4 commercially canned)
Greens and turnip tops	1		Beef	4	
Home brew	1		Sardines	2	(2 commercially canned)
Okra	1		Cheese	3	
Pimentos	1		Chicken	2	
Yellow beans	1		Potted meat	1	
Salad dressing	1		Sausage	1	
Succotash	1		Milk	1	
Tomato catsup	1	(commercially packed?)		31	
Tomato relish	1		Unknown (inclusive 1 home prepared food)	19	
				191	

elaborate a deadly poison in the cooked fruit irrespective of the acidity, provided certain bacteria or yeasts are growing concomitantly.

The observations of the past 10 years leave no doubt that all canning methods, whether commercial or home, should aim at absolute sterility of the product to insure freedom from *Cl. botulinum* or *Cl. parobotulinum*. In case this prerequisite cannot be met, acidification with citric acid, or with a mixture of acetic and citric acids, to a pH of at least 4.5 with subsequent heating of the product at 100° for a short period, should be practised. Such vegetables as artichokes, chilis, mushroom sauces, etc., can now be well preserved by the procedure of acidification.

From a public health standpoint it is imperative that the principles developed by the canning industry be applied to the methods of home canning. A vigorous, systematic program of continuous education may in time reduce or eliminate the many unnecessary deaths from botulism.

MUSSEL POISONING

After the serious outbreak of mussel poisoning¹ in July, 1927, in San Francisco and vicinity, in which 102 people, with 6 deaths, were involved, the problem of this intoxication was assigned to Dr. H. Sommer and his assistants. The question which deserved primary attention was to ascertain the time of year and the locality along the coast where the mussels would again be expected to become dangerous for human consumption. For this purpose a standard animal test which enabled the workers to examine mussels at frequent intervals was developed.* The result of the periodic examinations proved definitely that the Pacific Coast mussel (*Mytilus Californianus*) collected at various places from Monterey Bay in the south, to as far north as the mouth of the Klamath River, may contain a small amount of typical mussel poison at any time of the year.

To date very few samples have been tested outside of this area and therefore no definite conclusions can be drawn relative to the frequency of non-fatal doses of mussel poison in this shellfish in Southern California. Since mussels are consumed in large quantities without ill effects by the population along the coast, it is reasonable to conclude that the "slightly" toxic mussels are not important from the standpoint of public health.

During the months of July and August invariably the mussels become highly toxic and dangerous for human consumption. In 1928 "moderately" poisonous mussels were found from July 20 until Au-

* To be published.

gust 9 in one locality 50 miles south and in another 50 miles north of San Francisco. No human cases occurred during this season. The mussels collected between July 10 and August 14, 1929, from Pescadero to the mouth of the Russian River proved "moderately" to "very strongly" poisonous. These findings were promptly paralleled by the occurrence of 56 human poisoning cases between July 7 and August 6. Fortunately, only 1 of the intoxications proved fatal.

The outstanding observation of the 1929 outbreak of shellfish poisoning was, however, the occurrence of the cases of August 4 which were due to the eating of Washington clams. Three of the cases proved fatal. Subsequent animal experiments on clams showed that 7 of the 8 varieties examined were highly toxic, and especially the 2 large species, *Saxidomus nuttallii* (Washington clam) and *Schizothaerus nuttallii* (Horseneck clam), which contained a large amount of poison. The clinical observations as well as the laboratory findings indicate that the clam poison is a substance very similar if not identical with that of the mussel.

In midwinter, 1929-1930, "moderately" toxic mussels were collected north of Bodega Bay, and again in March, 1930, at Point Reyes. The latest findings during the summer of 1930 are entirely in accord with the experiences of the past 3 seasons. The mussels reached a degree of toxicity designated as "moderate" to "strong" from July 8 until August 22, with a maximum of "very strong" on July 26 near the mouth of the Russian River. On July 27 1 human case of mussel poisoning occurred in that vicinity. Of the clams tested *Saxidomus nuttallii* contained a small amount of toxin. The beds from which the mussels were gathered are all exposed to the open shore line subject to the ebb and flow of the tides, and, with one possible exception, never exposed to pollution by sewage. It is therefore noteworthy that in the course of the investigations it has repeatedly been demonstrated that the mussel poison cannot be detected with certainty in the San Francisco Bay mussels (*Mytilus edulis*) nor in the clams (*Mya arenaria*) of the same region.

In a score of other mollusks, echinodermata, and miscellaneous specimens collected in the vicinity of the mussel beds of the coast, no definite shellfish poison was demonstrated, although many of the samples exhibited a harmful action on the test animals. Toxic extracts with properties distinct from mussel poison have been obtained from fish eggs (crotus), starfish and chitons (*Mopalia muscosa*). These investigations required a special procedure.

The wet, dry and skeleton weight of the various shore animals had to be estimated, and the toxicity of the various solutes of sea water had

to be investigated since poisonous magnesium salts seriously interfered in the animal experiments when the extraction of the marine material was not carefully controlled. Numerous observations indicate that the mussels under water are often more toxic than those found above the mean water level. The maximum toxicity seemed to occur soon after or during the maximum tides of the year. In July and January, epidemiological as well as laboratory studies tend to indicate that the factor which renders the mussels poisonous begins to operate south of the Golden Gate and travels north. The influence of oil formation, influx of detritus, unusual odors, luminescence, turbidity and color of the water, changes in temperature, etc., have been recorded. However, their connection with the phenomenon of mussel poisoning has not as yet been successfully established.

The toxic mussels may have a typical odor of cyanide which in most cases is, however, very faint. The hepato-pancreas of the harmful shellfish usually is larger and softer and is often of a greenish color, lighter or darker than the normal digestive gland. Experience has shown that these anatomic and metabolic changes may allow a differentiation of the innocuous from the harmful specimens.

In most cases the occurrence of mussel poisoning coincided with the spawning season although the two phenomena do not run strictly parallel. *Mytilus Californianus* has been found to spawn in mid-summer, in midwinter, and in certain localities during the spring. At least in the San Francisco Bay region the mussels pass through two spawning seasons during the year, and detailed histological examinations of toxic and non-toxic mussels have not revealed any consistent differences, though the studies are still in progress. In this connection a study of the sea water in amounts up to 3,000 liters was undertaken. The water was filtered and the plankton examined and tested for toxicity. During, as well as before and after, the toxic period, micro-organisms of the ocean water were found to contain neither shellfish poison nor other similar toxins.

Attempts to produce poisonous mussels by exposure, suffocation, etc., at various temperatures in and out of sea and fresh water have thus far failed. A slight formation of poison may take place when mussels are treated with illuminating gas. Cyanide is without effect on the toxicity of the mussels. The ability of shellfish to store poisons has repeatedly been demonstrated, particularly in experiments with strychnine.

Preliminary pharmacological investigations with a purified shellfish poison have given the following prominent results: Slowing of respiration after small doses; violent dyspneic movements, and respira-

tory failure after injection of lethal doses. The action on the blood pressure is complex and consists in general of a depression followed by a secondary asphyxial rise. The initial effect on the heart rate is characterized by an increase with subsequent slowing of the beat. The heart continues to function slowly after respiration has stopped. The poison is rapidly excreted through the urine (30 per cent in 2 hours). Amiodoxyl does not oxidize the poison *in vivo* or *in vitro*. Injections of caffeine rather hasten the death caused by shellfish poison, probably on account of the increased rapidity of absorption.

As a precaution against occurrences of mussel poisoning, the State Department of Public Health regularly issues a warning against the use of mussels during the period when they are particularly liable to be dangerous. Their sale has been forbidden during the past 2 summers. The quarantine is only lifted after repeated tests of numerous mussel beds have shown that the mollusks are "slightly" or non-toxic.

REFERENCES

1. The frequency of botulism: Report of outbreaks for 1927, *J. A. M. A.*, 90: 764, 1928.
2. Geiger, J. C., Dickson, E. C., and Meyer, K. F. The epidemiology of botulism, *Pub. Health Bull. No.* 127, Sept., 1922, pp. 1-119.
3. Esty, J. R., and Meyer, K. F. The heat resistance of the spores of *B. botulinus* and allied anaerobes, *J. Infect. Dis.*, 31: 650-663, 1922.
4. Cruess, W. V., Fong, W. Y., and Lin, T. C. The rôle of acidity in vegetable canning, *Hilgardia*, 1: 275-293, 1925.
5. Schoenholz, P., Esty, J. R., and Meyer, K. F. Toxin production and signs of spoilage in commercially canned vegetables and fruits inoculated with detoxified spores of *B. botulinus*. XII, *J. Infect. Dis.*, 33: 289-327, 1923.
6. Processes for non-acid canned foods. National Cannery Association Research Laboratory, Washington, D. C., *Bull. No. 26-L*, 32 pp., Jan., 1930.
7. Zlatogoroff, S. I., and Soloviev, M. N. Botulism in Union of Socialist Soviet Republics, *J. A. M. A.*, 88: 2024-2025, 1927.
8. Meyer, K. F. Botulismus. *Handbuch d. pathogenen Mikroorganismen* (3d ed.), p. 1269.
9. Leighton, Gerald, and Buxton, J. Basil. The distribution of *Bacillus botulinus* in Scottish soils, *J. Hyg.*, 28: 79-82, 1928.
10. Zeissler, J., and Rassfeld, L. Die anaeroben Sporenflora der europäischen Kriegsschauplätze 1917. *Veröff. a. d. Geb. d. Kriegs- u. Konstitull.*, 5: 25, 35, 1928.
11. Robinson, E. M. Unpublished Doctor Thesis. Johannesburg, 1930.
12. Gunnison, J. B., and Meyer, K. F. Cultural study of an international collection of *Clostridium botulinum* and paratubulinum, *J. Infect. Dis.*, 45: 119-134, 1929.
13. Meyer, K. F., and Gunnison, J. B. South African cultures of *Clostridium botulinum* and paratubulinum, with description of *Cl. botulinum* type D n. sp., *J. Infect. Dis.*, 45: 106-118, 1929.
14. Meyer, K. F., and Gunnison, J. B. Botulism due to home canned Bartlett pears, *J. Infect. Dis.*, 45: 135-147, 1929.
15. Meyer, K. F., Sommer, H., and Schoenholz, P. Mussel poisoning, *J. Prev. Med.*, 2: 365, 1928.

Diphtheria Prevention on a State-wide Basis and the Part the Public Health Nurse Has Taken*

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WHO shall say where or how the best toxin-antitoxin campaign has been developed; and would such a statement help the further development of the project to any great extent? We have chosen to outline certain experiences in developing toxin-antitoxin campaigns in New York State, because that is the territory with which we are most familiar.

The diphtheria prevention program on a state-wide basis became a joint major activity of 5 state-wide official and nonofficial organizations in January, 1926, and has remained so for 5 years. The New York State Department of Health provided official direction and organization service and advice through its field workers, and supplied toxin-antitoxin mixture free to local health departments and to private physicians. The State Department of Education secured the interest of local boards of education, of school medical inspectors, of school nurses and school teachers, and issued a statement to all parents and all school authorities asking their help to eradicate diphtheria.

The Metropolitan Life Insurance Company through its Welfare Division gave financial support, supplied a huge amount of excellent free literature, moving picture films, statistical service, and special speakers both for radio broadcasts and for local groups. The company solicited the active participation of its field agents, local district managers, medical examiners and visiting nurses. The State Committee on Tuberculosis and Public Health of the State Charities Aid Association put its long years of experience in health promotion through local organization to work. Practically every medium of popular health education was utilized to secure public support and to bring the various official and voluntary agencies together for a concentrated attack on diphtheria.

* Read at a Joint Session of Child Hygiene, Public Health Education, and Public Health Nursing Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

The State Medical Society sent an announcement of the purposes of the campaign to every physician in the state; while the President and the Executive Officer personally visited local medical groups to stimulate and plan for their part in the program. Nearly every medical society in the state endorsed the project and some took an active part in local campaigns.

The work of all these agencies was directed and coördinated by an Executive Committee composed of representatives of all participating agencies. The committee held monthly meetings to formulate plans, direct organization and publicity, and to appraise results. With this pooling of the efforts of the parent organizations the diphtheria prevention campaign was started.

The result was the almost immediate awakening of local interest to the extent that the health departments and local health agencies of many up-state cities and towns immediately placed diphtheria prevention through immunization as one of their major activities.

As a logical development of the type of organization of the state-wide movement, local organizations followed somewhat the same plan with variations to fit local needs. In a community where the greater proportion of children is unprotected, the problem is to find the most effective way of securing the immediate immunization of a sufficient number to affect the incidence of diphtheria. The campaign method has proved its value in this respect; what will come later to secure continuous immunization is another question.

PLAN OF CAMPAIGN

The type of local campaign which has found most favor, judging by the frequency of its use, is the short intensive drive which aims to place diphtheria prevention in the center of the stage for a brief period terminating in large immunization clinics. The local health officer is responsible for the work. He secures the active aid of representative people; representatives of agencies, official, semi-official, and private, of the press, church and school, all of whom give actual help and lend prestige to the work. Sub-committees are formed each with a definite job. Thus the work of publicity, education, house-to-house canvass, finance, transportation and clinic assistance is taken care of.

The territory is divided into districts for ease in handling, but the work is carried out simultaneously in each district following the plans mapped out by the central committee. Besides the usual kind of publicity, all types of spectacular publicity stunts are used to create a public consciousness regarding the situation in such a way as to stimulate immediate action from the parents of children. House-to-

house visits are made by informed workers; usually volunteer lay people with the help of public health nurses, who interpret the subject to the parents and endeavor to secure a signed request card which is a promise that the children of the family will be taken for immunization either to the family physician or to the clinic. Subsequent follow-up of delinquents is carried on.

The campaign is terminated by the holding of large clinics at which all children who bear consents from their parents are immunized. The clinics are continued usually 5 or 6 weeks to take care of those who failed to appear but who may be brought in through the follow-up by public health nurses. This follow-up is of utmost importance and upon its thoroughness will depend to a large extent the success of the work.

RESULTS

The results that have been obtained from such campaigns can be judged by a brief statement of the accomplishment in some of the communities where a campaign has been conducted with an energetic follow-up program. Middletown has succeeded in immunizing about all its school children, and in 1929 reported protection in more than 70 per cent of those under the age of 5; Ogdensburg over 60 per cent; and Mamaroneck over 50 per cent of this lowest age group, in addition to a protected school population. Utica started a community campaign in February, 1927, and by July reported that the number of immunized children had increased from 38 to 68 per cent of the 5-9 age group and from 9 to 29 per cent of the under 5 age group. In the city of Niagara Falls an intensive campaign was started in March, 1928, and by the end of May the reports showed an increase of immunized children of the age group 5-10 from 67, which was the 1927 figure, to 95 per cent, and in the lowest age group from 8 to 43 per cent.

These figures serve to prove that this type of intensive campaign does produce the results desired in initiating a diphtheria prevention program, and if well directed will secure the immunization of a sufficient number of children both of the school and preschool group to reduce the morbidity and mortality from diphtheria in a given community.

THE PART OF THE PUBLIC HEALTH NURSE

The public health nurse has taken her part to help obtain these results. She usually becomes one of the official assistants of the health officer, who helps to interpret the plans to coworkers without

the health department. She does her share in instructing lay workers, receiving their reports, smoothing out difficulties, giving advice; and she follows up the parents who have been reported uncoöperative by the lay home visitors. She is usually responsible for the physical arrangement of the clinic rooms, for the details of clinic preparation, for assigning untrained helpers to the work they seem best fitted to do. The work she does during the campaign, however, is only incidental to her greatest contribution, which will be mentioned later.

CAMPAIGN EXPERIENCES

The early experiences of several communities where the first intensive campaigns were conducted demonstrated 3 important facts:

1. It was unnecessary to have a diphtheria epidemic to awaken public interest.
2. This interest could be a substantial one consisting of willingness to canvass, to lend and drive automobiles, and to perform clerical and other services in assisting at clinics.
3. A brief campaign of preparation was equally if not more effective than a long one.

These facts are important enough to bear discussion. The first one answers a controversial question. Many experienced public health workers have felt that the interest of the public cannot be awakened to the point of individual action unless the point in question has "struck home." This is true to a certain extent as is demonstrated by the fact that many more immunizations are secured when home visits are made to interpret to the parents the personal application of the problem which has been called to their attention through the channels of publicity. However, the evidence is that a striking individual or community situation need not be the basis for successful appeal; it can be made on the ground that it offers a necessary health measure to safeguard the children of a community. This point may be more pertinent to the situation in up-state New York because the first city-wide immunization campaign, which was a demonstration, was carried out in Auburn where diphtheria mortality and morbidity rates were high. The splendid success of the work in Auburn was thought by many to be due to the fact that diphtheria presented a community problem out of which capital was made in securing effective immunization. Numerous experiences have proved conclusively that such a local situation is unnecessary.

The second point is history repeating itself. We have many examples of concerted action for a worthwhile cause where all hands pull together under direction to accomplish a definite purpose. An experienced leader, a well thought out plan, careful definite instructions to workers, and a time limit, are the requisites necessary.

The third point is a good one to remember where volunteer workers aid in carrying out a big project. Their time will be generously given for short periods but cannot be drawn on indefinitely. The thrill of speedy returns to which all humans respond provides the driving power to keep volunteer help on the job. Much can be said in favor of steady dogtrotting methods, but whatever their merits, they have no place in the plan of work we have been discussing.

Another type of campaign was carried out in the city of Schenectady, initiated and sponsored by the County Medical Society. A physician was employed on part-time to supervise the work, and the services of a clerk provided. The plan was to interest the medical profession of the city and to hold the profession responsible for the immunization of the preschool population. The hope was that the physicians would make immunization a part of their routine practice to such an extent that continuous immunization would be carried out. Indigent parents, who are said to represent a very small percentage of the people of that community, were to take their children to public clinics. It was thought that immunization clinics were unnecessary except for indigents and that most people would prefer to go to their family physicians and pay for their services. The city was divided into districts and the Health Department gave its nursing service to make a house-to-house canvass. The nurses were to return card reports of consents, on which was to appear the name of the family physician. Any person claiming to be unable to pay was offered the alternative, on certification of the nurse, of going to his family physician gratis or going to a free clinic to be held later. Publicity was carried on through the usual channels. This method of campaign was continued for nearly 3 years and ended January 1, 1929.

The results were not all that the Medical Society had hoped. While it succeeded in securing about twice as many immunizations of children under 5 as of children 5-9 years old, the total of immunizations was too small to insure a community protection against a considerable increase or an epidemic of diphtheria. Whenever the nurses, for one reason or another, ceased to canvass, there followed a decline in the number of reported immunizations, indicating that the physicians of themselves apparently had not been securing a large number of immunizations. The cost of bringing a child to the family physician or to a clinic for immunization was \$2, exclusive of the salary and expense costs of the nurses engaged in carrying on the canvass. This was also exclusive of the physician's fee. In no other community was such a cost even approached.

The campaign failed also to develop a community immunization

consciousness or to secure the participation of unofficial organizations. As a consequence the local health department at the end of the campaign faced the same situation which other communities faced at the beginning of 1926, and has made little recent progress.

Another plan attempted in a small community is interesting. A county public health nurse, with the advice and approval of the health officer, called up the physicians of the community and offered to visit the families of their patients where there were children, to explain to them the need for diphtheria immunization and to urge them to go to their family physicians on a certain day which they would designate. She offered her assistance to them for this "office (pay) clinic." Supplies could be secured in advance and the "fussing for one child" process would be eliminated. For some reason the physicians hesitated to accept such help even though they thought the scheme would work; so it fell through without a trial. Such a plan might hold possibilities for further experiment and might be very successful for small communities if sponsored by good community organization.

Other experiences could be mentioned but they would be to a large extent variations of the plans above outlined. The test of any campaign is whether or not it results in a number of immunized children of both the school and preschool age groups sufficient to eradicate diphtheria from the community. The importance of protecting the preschool age group cannot be too strongly emphasized. Many communities in the early days of the campaign followed the line of least resistance and thereby immunized a very small percentage of the preschool group. A study of their records for diphtheria morbidity and mortality proves without doubt that a community will only be protected from diphtheria when 25 to 30 per cent or more of the lowest age group is immunized, perhaps in addition to the school population.

There are many factors to consider in planning a campaign which will reach the objective with the least waste of time, energy and money. The magnitude of the problem should be judged by determining how many unprotected children there are in the community. The method of approach should be determined by the character of the community, the financial status of the people, the average intelligence, the racial make-up of the population, the influence of church and other organizations, and other factors peculiar to a community which will suggest themselves to one familiar with a local situation. Thought should be given to the right of the medical profession and of other organizations—official, semi-official and private—to participate in a community undertaking of such vital importance.

After 5 years of experience in our state it is possible to outline

with some degree of assurance the steps for a successful community campaign of diphtheria prevention through immunization.

The plan should provide for:

1. Concerted community action through utilization of the prestige and help of medical profession, of official, semi-official and private organizations, of representative lay people, of church, schools and of press
2. Adequate publicity to awaken community consciousness to the problem
3. A preliminary house-to-house canvass and subsequent follow-up of those who failed to respond
4. Adequate clinic service
5. Careful record keeping and appraisal of results
6. A follow-up program to secure continuous immunization of infants at 6 months of age

The above plan is not offered as the best one by any means but, given good leadership to adapt it to a local situation, it has proved its possibilities for success in initiating a diphtheria prevention program in a community. After public opinion has been created and after the first big job of immunization is over will come the part of the task that will insure continuous protection to the child population. It is for this task the public health nurse will make her greatest contribution. This is rendered day in and day out through her ability to reach the parents in the community, and to interpret to the parents the reasons for immunization in language they will understand. She may be aided by occasional intensive campaigns and by constant publicity; but in the long run as long as she holds her place as the most effective home visitor in the public health field, health authorities will depend on her skill in persuasion, on her effective teaching to secure continuous immunization of each year's crop of babies. A community cannot hope to safeguard its children from diphtheria permanently unless it expects such service from its public health nurses and sees to it that the results are obtained.

One health officer in a town where the average number of births is 300 a year has told the public health nurse he expects her to secure an average of 30 children for immunization each month. The campaigning is over and the work must go on. In fulfilling that requirement the public health nurse is taking her part in insuring her community against diphtheria.

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POSTVACCINAL ENCEPHALITIS

SINCE the days of Sir Edward Jenner, vaccination against smallpox has held its own as one of the greatest preventive measures ever discovered. It has been attacked on various grounds, religious and otherwise, but the world has accepted and practised it to the great benefit of mankind, and the saving of human life.

The mistake of holding that a single vaccination protects throughout life has been generally made. Waterhouse, 1799, said: ". . . A person who has undergone the local disease and specific fever occasioned by the cow-pox infection is thereby rendered ever after insusceptible of the small-pox." We have pointed out this fallacy in these columns and urged vaccination and revaccination, statistics in armies and other bodies where control is complete showing the value of this procedure as against the single inoculation.

A new factor has recently appeared. We were startled a few years ago by the appearance of encephalitis following vaccination. In Holland the cases were comparatively numerous, but at worst, they were small in number compared to the total number of vaccinations, though they led to a temporary suspension of vaccination. Cases were reported from England, and a few from other European countries. Our Public Health Service has been awake to the situation from the beginning, has made extensive studies, and kept close watch on developments. Altogether, some 57 cases of encephalitis have occurred in

America during the last ten years. In the light of the facts now known, what should the responsible physician recommend?

Ordinarily there is not the slightest ground for the omission of vaccination against smallpox. Exceptionally, it may be prudent to postpone it. Even if the number of bad results of which we are aware is smaller than the actual truth, still the procedure does vastly more good to society than harm. We have become so accustomed to the mild types of smallpox that many have grown careless. Sanitarians and physicians have warned people that the neglect of vaccination would be followed sooner or later by a return to the old virulent type in which the mortality was close to 50 per cent. This prediction has been verified in Kansas City, Detroit, Minneapolis, and Denver fairly recently. An analysis of the results of vaccination in many of these epidemics will convince all reasonable people that the disease was tremendously fatal in the unvaccinated, very slightly so in those once vaccinated, while the revaccinated were practically free from danger. Further, the epidemics were arrested in comparatively short order by vaccination. Within the memory of many living people the terrible experience of Montreal stands out against these favorable results.

So far from being afraid of vaccination we should urge it more than ever before, and recommend especially vaccination during the early months of life, before teething, since untoward results at this early age are exceptional. Revaccination should follow at proper intervals, especially in early life, and at school age, since smallpox is a disease of that period.

No human procedure is infallible. Health officers and physicians should arm themselves with the facts as to the occurrence of smallpox before the introduction of vaccination, and at the present time. We should acknowledge the very slight risk which attends the procedure. We can no longer tell people that it is entirely devoid of danger, but we can assure them that the beneficial results to the community far outweigh the danger. Further, there is some reason to believe that encephalitis following vaccination may be connected with the greater prevalence of epidemic encephalitis and poliomyelitis observed in several countries, and that with their decrease, postvaccinal encephalitis will also diminish.

After more than a century of experience under all conditions, we can unhesitatingly endorse the findings of the College of Physicians of London: ". . . that the public may reasonably look forward with some degree of hope to the time when all opposition shall cease, and the general concurrence of mankind shall at length be able to put an end to the ravages at least, if not to the existence, of small-pox," and the Re-

port of the National Vaccine Establishment: "The Board have infinite satisfaction in stating the two following important and decisive facts in proof of the efficacy and safety of vaccination, viz., that in the cases which have come to their knowledge, the small-pox after vaccination, with a very few exceptions, has been a mild disease; and that, out of the many hundred thousand persons vaccinated, not a single well-authenticated instance has been communicated to them, of the occurrence of a fatal small-pox after vaccination."

STANDARD METHODS OF COST ACCOUNTING FOR PUBLIC CLEANSING WORK

THE cost of street cleaning and collecting and disposing of garbage, ashes and other solid municipal wastes is now largely a matter of conjecture, so far, at least, as American cities are concerned. Nobody knows how much a city ought to pay for this service per capita or how much it does pay. Few, if any, keep records which attempt to cover the whole cost, including the work done by private scavengers, much less are able to report correctly on the cost of machine sweeping or of hauling or disposing of the wastes produced.

An attempt to standardize cost keeping in street cleaning and refuse collecting and disposition in American cities is being made through the Committee on Uniform Street Sanitation Records. This committee represents primarily the International Association of Public Works Officials, formerly called the International Association of Street Sanitation Officials. Other organizations represented in an advisory capacity include the National Committee on Municipal Standards, the International City Managers' Association, the American Society of Municipal Engineers, the Governmental Research Association, the American Society of Civil Engineers, the American Municipal Association, the American Road Builders' Association, the National Municipal League, and the American Public Health Association. The work is financed and staffed by the International City Managers' Association, through funds supplied by the University of Chicago and the Julius Rosenwald Fund.

The committee has issued what it calls a preliminary report and is now engaged in promoting a scheme of cost accounting based on certain standard work units which it proposes shall be universally employed in American cities. One of these units is called the "street cleaning mile." The theory is that distance rather than area is the important thing to record, the idea being that "the work is all applied in a lineal direction." The general custom up to now has been to consider the number of square yards cleaned as giving the best indication

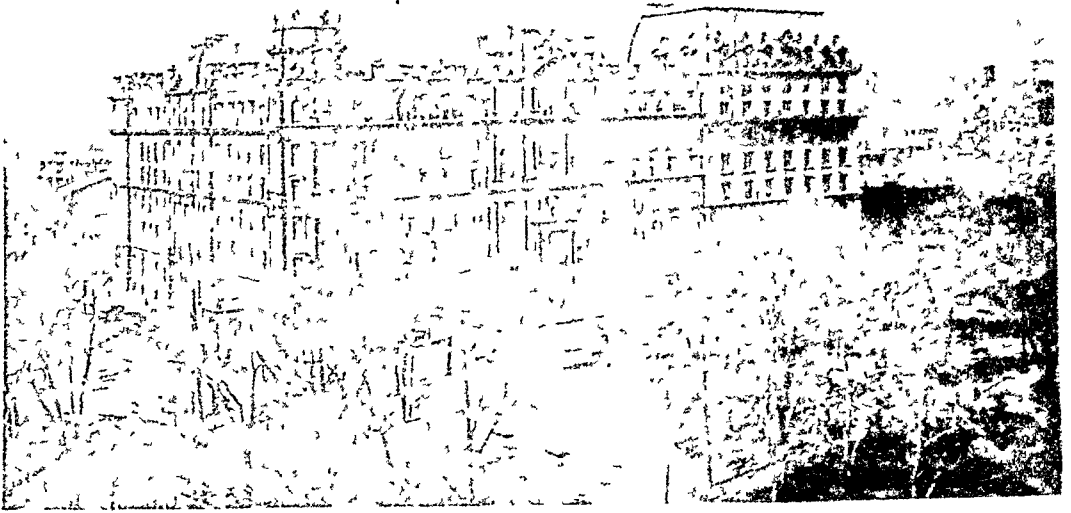
of the work done. Again, the committee considers the cubic yard as the best unit of measure of refuse. At present custom is divided between the cubic yard and the ton. In the one case the quantity is usually estimated, in the second it is weighed.

The scope of the committee's work includes the results of all methods of sweeping and cleaning the pavements; catch basin cleaning; snow clearing and removal; garbage, ashes and refuse removal; removal of dead animals and night soil; and the ultimate disposal of the wastes collected. It does not describe how any of this work should be done. It does not include sewerage construction or maintenance, or sewage disposal, although this subject has much to do with street sanitation because of the part played by sewers in carrying off storm water and washings from the streets. The kind of pavement and its state of repair are not apparently allowed for although these have much to do with the sanitary condition of streets and the cost of cleaning them.

It is worth noting that the standards proposed do not take into account the dirtiness of the streets to be cleaned nor the degree of cleanness achieved. These would seem to be essentials, without which any records of efforts expended can have but little value.

"Installations" of systems of record keeping have been begun by the committee and the promotion of the ideas put out in the "preliminary report" is being actively pushed. In a recent press release the first complete installation of the records and cost accounting proposals of the committee is reported as made at Brunswick, Ga. A complete description of what has been begun there, with all the forms employed, is to be distributed to 800 other cities in this country. The committee explains: "This honor was accorded to Brunswick because it is performing all types of activities" included in the committee's program.

The idea of trying to put public cleansing on a businesslike basis, at least so far as reporting what is done goes, is worthy of all praise, and it is to be hoped that the committee has found a good way to make a start at it. It is a long step from the present state of the matter to the state of accountability aimed at by the committee and one cannot help wondering how many of the practical men in charge of this kind of work will willingly accept the forms and other proposals of the committee. How helpful such records can be in presenting a picture of what is done is not entirely clear.



Windsor Hotel, Headquarters of the A. P. H. A.

MONTREAL AND ITS PAST

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IN this new world of America, there are not more than three or four cities which can boast of three centuries of existence. Montreal is quickly nearing that goal, having been founded in 1642. On that account, it is probably not out of season to cast on its past at least a rapid look.

Montreal was actually started in 1642, but if we are to measure the complete span of its history, we must go back to 1535 when the land on which it now proudly rises was trodden by the first white man, none other than Jacques Cartier himself, the discoverer of Canada. Undoubtedly, the famous navigator, while he was sitting among the Indians on the slope of Mount Royal, never dreamed that the round shaped village of Hochelaga would some day be changed into the immense agglomeration of structures we are now

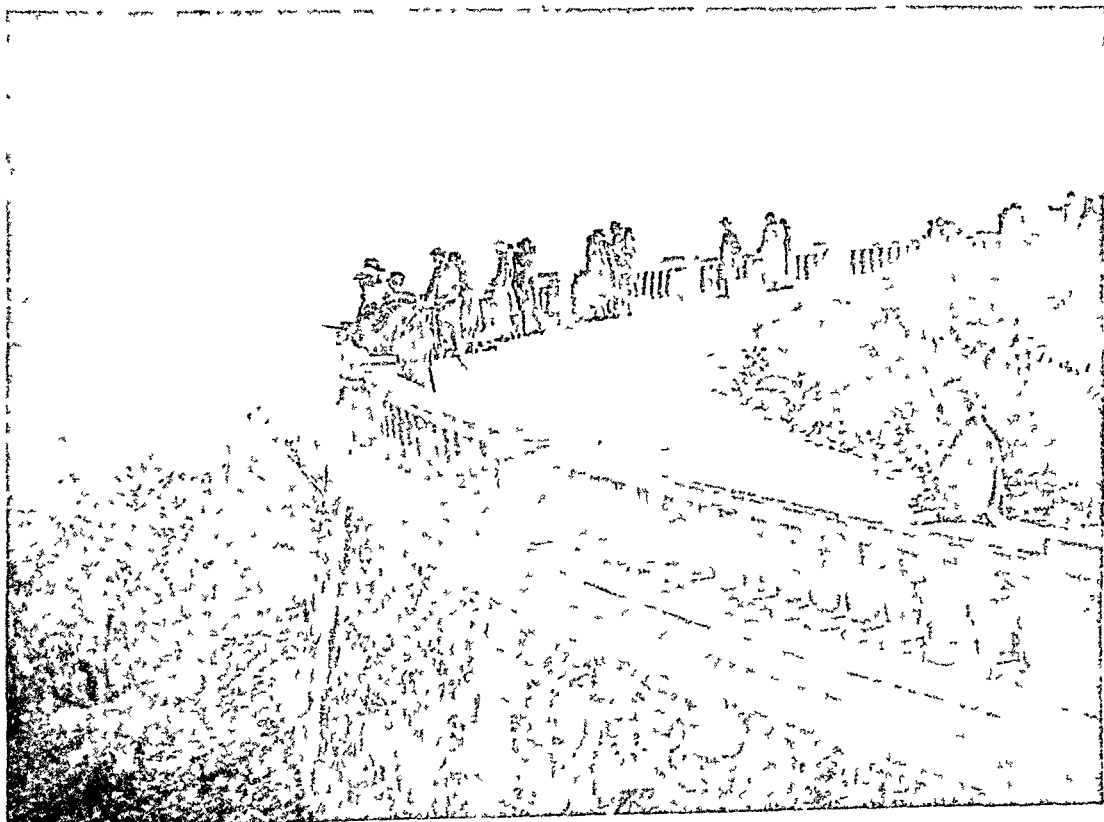
witnessing, but he nevertheless marked for civilization the very spot on which he stood. The birth of the Canadian metropolis may be truly said to date from his landing at Hochelaga.

A little more than a hundred years, however, were to elapse between Cartier's first claim of Hochelaga as a new domain of the King of France and the actual planting of a city on the chosen land. During the interval, time has wrought many changes. In 1615, when Champlain, the second of his race, visited the site of Hochelaga, the Indians who greeted Cartier had already been driven toward some other country, probably by the misfortunes of war, and no trace even was left of their once prosperous village. The island had become a wilderness through which occasionally roamed migratory hordes of savage hunters. For some time again the only

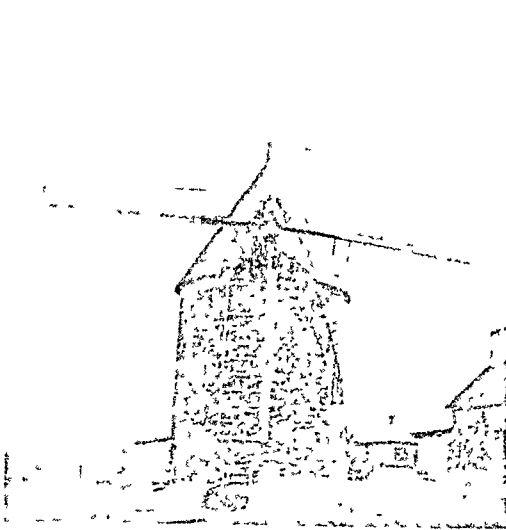
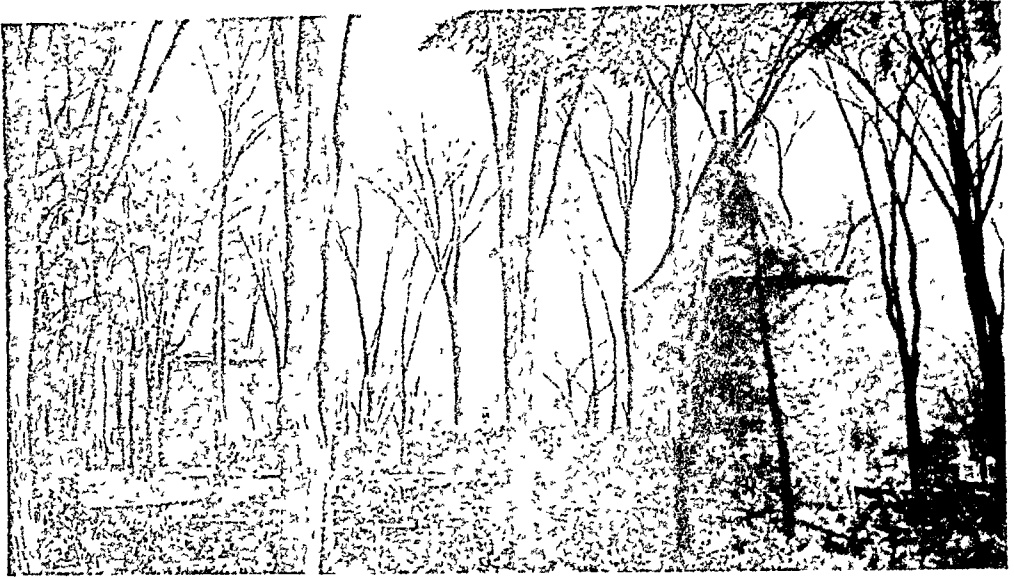
white men who passed its shores were a few missionaries and hardy voyageurs headed toward the great lakes. Everybody of course was struck by the wonderful situation of the place but, in the infancy of the colony and with only a handful of defenders, there could be no thought of venturing the establishment of a post on a spot so far advanced and so extremely dangerous. To undertake such a daring enterprise at the time required more than the ordinary nerve of courageous explorers—it required the mystical enthusiasm of men who sincerely believed they answered a call from above. It is indeed remarkable that the foundation of Montreal was entirely and solely commanded by religious zeal. There was also more than a tinge of mysticism in the ad-

venture of the Pilgrims of Plymouth twenty-two years previously, but while the passengers of the Mayflower were actuated principally by a yearning for religious freedom, Maisonneuve and his followers thought only of the conquest of souls.

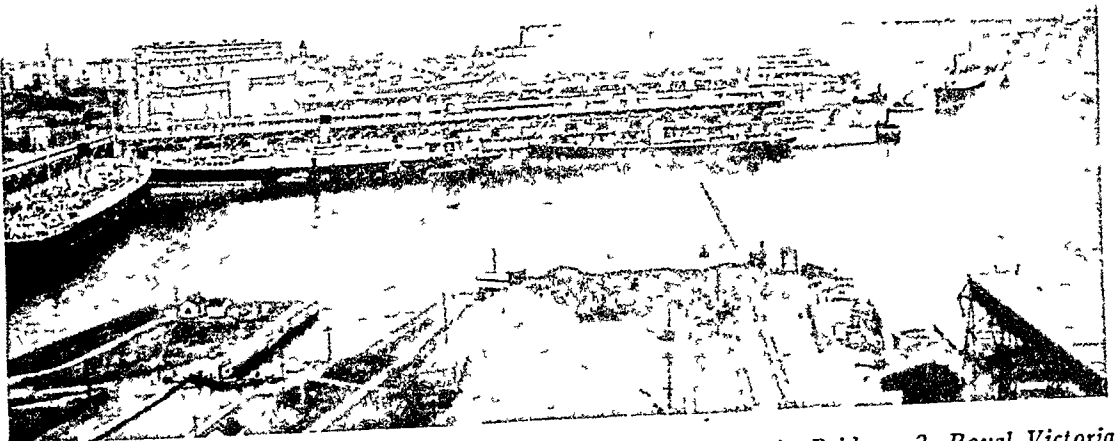
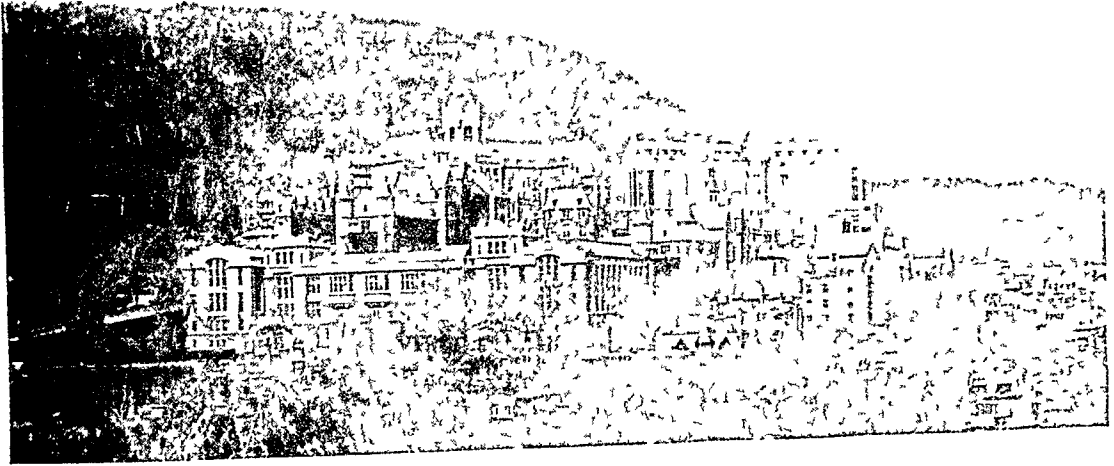
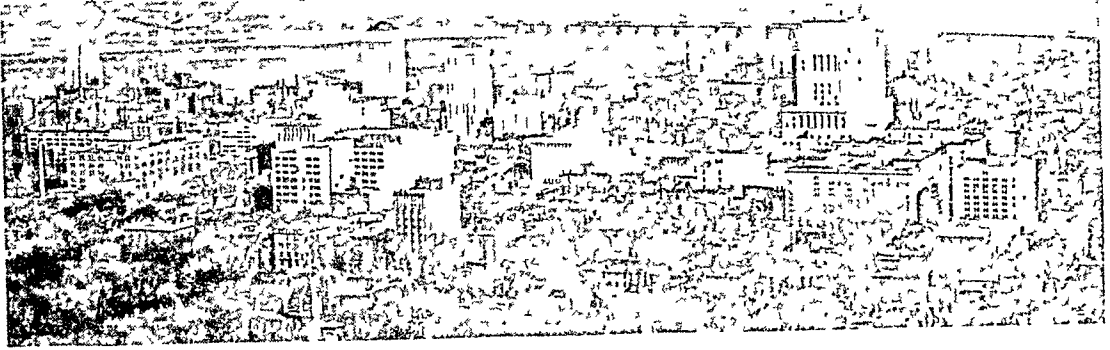
There is even a touch of supernatural flavor in the wonderful beginnings of the Canadian city. It is said that two pious gentlemen of France, who till then had never known each other, the priest Jean Jacques Olier and the layman Jérôme leRoyer de la Dauversière, had at the same moment a dream in which they saw clearly the configuration of the island of Montreal, although they had not known of it before, and heard an inner voice compelling them to establish a new colony for the furtherance of



Mount Royal is in the center of the city. It is a natural public park of 550 acres, 600 ft. above sea level. From this Look-Out on a clear day to the south may be seen the Adirondack Mountains, to the south-east the Green Mountains of Vermont, and to the east the Laurentian Range. At the base of the Look-Out may be seen the center of the city of Montreal, and the St. Lawrence River, also the harbor and the great canal system connecting upper lake transportation with the St. Lawrence River traffic.



1. Sturdy stone towers, built for defence against the Indians in Ville Marie's early days, standing in grounds of Montreal Seminary, Sherbrooke Street West. In one tower the pioneer nuns lived, in the other they taught the children of the settlement. 2. The wind mill and the outdoor oven are still used in Rural Quebec. 3. Chateau de Ramezay, erected in 1705, residence of the French and English governors of colonial Canada, and now a museum.



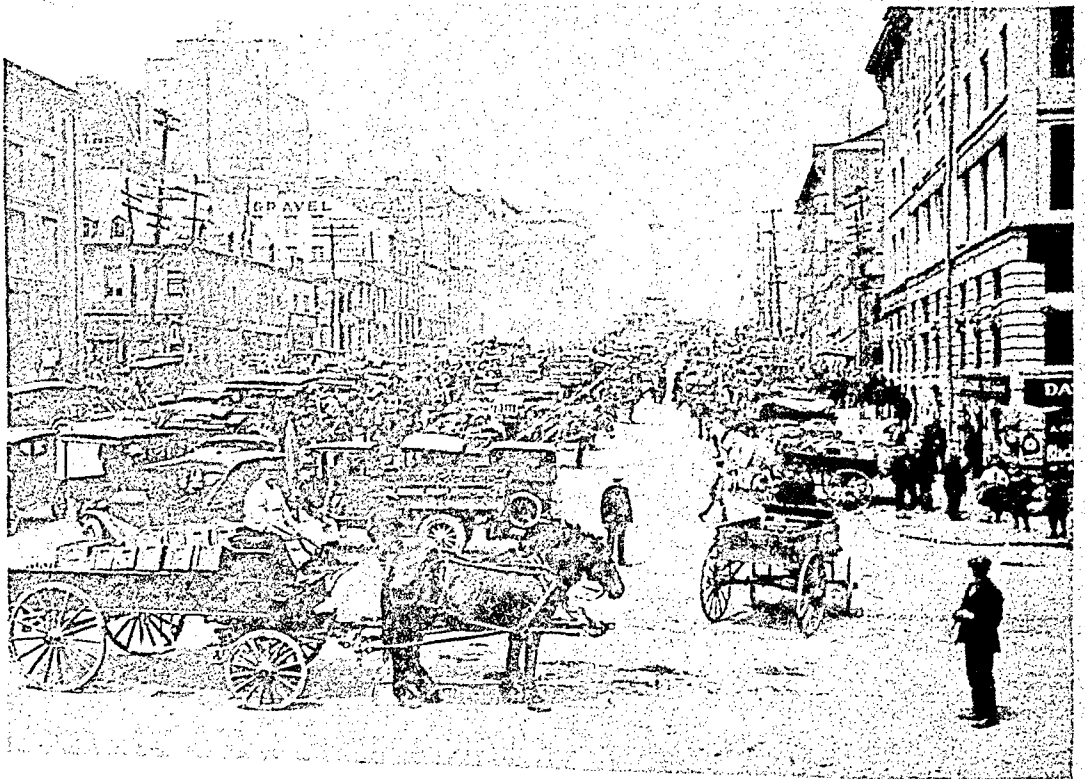
1. Panorama of Montreal showing Canadian National Victoria Bridge. 2. Royal Victoria Hospital is a monument to the generosity of Lord Strathcona, Lord Mount Stephen and J. K. L. Ross. 3. Montreal Harbor is owned and operated by the Canadian Government. It is a national port, and is managed by a special commission called the Montreal Harbor Board.

the glory of God. At all events, the two men providentially met in Paris and, after having by their joint efforts formed a society of no less ardent contributors, called "la Compagnie de Notre Dame de Montréal," succeeded in fulfilling their godly task. On May 18, 1642, the first settlers landed in Montreal, or, as it was then called, Ville-Marie. They were about 60 in number including half a dozen women. It was a very humble beginning for what was to become one of the large cities of the world.

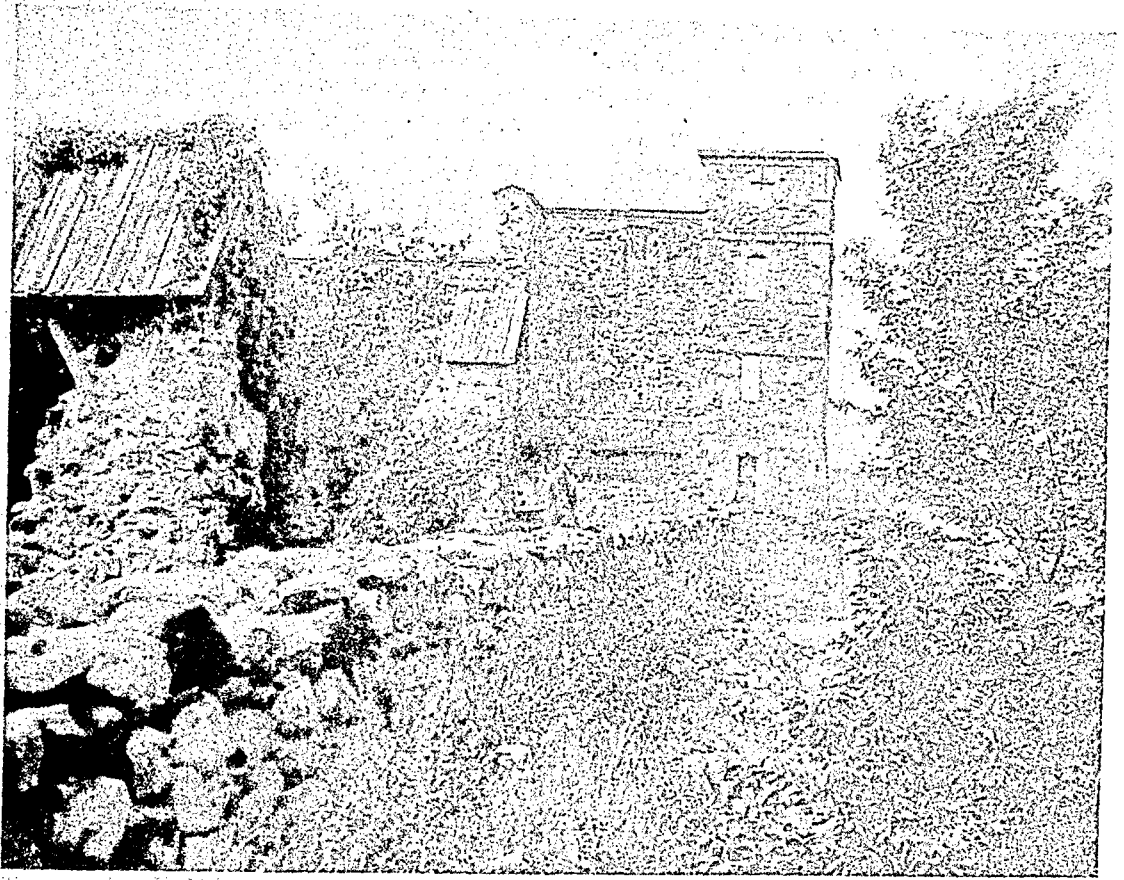
The newcomers first busied themselves in building a roof which would shelter them from the rain and a palisaded fort which would defend them against the Indians lurking in the surrounding woods. The task before them was arduous, but they were fortunate in having as a leader a man whose bravery

was equal to his righteousness, a man whose name is revered to this day, and has never been tainted with the smallest blemish—Paul de Chomedy, Sieur de Maisonneuve. When pressed by Governor Montmagny to desist from his rash enterprise, this true Chevalier proudly answered: "Even if every tree of the island were to be changed into a fighting Iroquois, I am bound to go thither and I will." His fortitude inspired his followers with the necessary courage to withstand the enormous difficulties and still more to face an unceasing danger. A small band far from any possible help, they were practically in the jaws of death, continually exposed to the cruel attacks of the ever menacing Indians.

For years, the colonists had to till their soil with one hand on the plow and the other carrying a musket. The losses were so great that, after ten years,



Bonsecours Market is located in one of the oldest sections of the city. It is opposite the City Hall and next to the Chateau de Ramezay, located near the harbor. On Tuesdays and Fridays, which are market days, the French-Canadian habitant brings his vegetables into Montreal to sell openly on this market. Visitors to Montreal find it a most interesting place to visit.



Old fort at Chambly, on the Richelieu River, 14 miles from Montreal. Built in 1710 on the site of an earlier fort, it has been fought for, taken and re-taken many times, being held in turn by French, British, United States and Canadian forces.

notwithstanding two or three arrivals of recruits, the white population of the island was still but 60. Another decade, and the infant colony very nearly came to its end when seven hundred Iroquois descended the Ottawa River determined on the complete and definitive massacre of the "pale faces." It was saved only by the heroic and almost superhuman sacrifice of Dollard des Ormeaux and his 17 companions, who went to meet the enemy at the Long-Sault and so bewildered them by a fight of several days that the survivors fled back to their country.

Even after the coming, in 1665, of the Carignan Regiment, which was ordered to New France in order to quell the Iroquois incursions, Montreal enjoyed only a relative peace. For years it bore the brunt of the attacks which

occurred and remained literally the bulwark of the country. It was not until the end of the 17th century, after the massacre of Lachine, the last great disaster of the kind, that tranquillity was at last obtained and the city, with a population of about 1,000, began to prosper. Quebec, the capital, was still the chief town, but Montreal was slowly and surely gaining. On account of its privileged situation at the head of inland navigation, it had soon become the recognized center of the fur trade. Indians flocked from all sides to its shores with skins, and at the annual fair especially, the town was the scene of an extraordinary, but somewhat boisterous, activity. Montreal also provided the larger part of the famous "coureurs des bois," who ought to be pardoned for much of their lawlessness in view of the

enormous service they rendered civilization by their adventurous discoveries. Many of the great explorers who paved the way for the development of this continent have hailed from Montreal, LaSalle, Iberville, Lamothe Cadillac, Tonty, Dulhut, Bienville et Perrot.

Thus Montreal continued to thrive as a center of trade and enterprise until the end of the French regime. Its progress was for some time halted by a disastrous fire and still more by a considerable exodus which in a few years reduced the population from 8,300 to 5,700, but it soon resumed its former pace and even increased it. The incoming of the British element, which added to the wonderful qualities of endurance of the sturdy native race its own qualities of resourcefulness and enterprise, gave a new impetus to the life of the community, and at the end of the 18th century, Montreal had already taken the lead over the older city of Quebec, in population as well as in importance. Once more it had been in the throes of the war, in 1775, when, after a first abortive attempt by Ethan Allen, Montgomery finally entered it and raised over its walls the flag of the Independent Colonies. The ordeal, however, was of a short duration and in May, 1776; the city was restored to British rule, never to be disturbed again by invaders. Benjamin Franklin, who came to Montreal as an envoy of the Congress with Chase and Carroll, was not over happy in his mission, but he is none the less thankfully remembered for that most beneficent gift he left them, the printing press.

From that time, the history of Montreal may be summed up in these two

words: progress and industry. Even the political wrangles which were rife in its midst for so long a period, even the War of 1812, which happily left it unruffled—thanks to the timely victory of Salaberry at Chateauguay—even the troublous times of 1837–1838 which so tragically ended with the death on the scaffold of nearly a score of patriots, could not impede its steady march toward greatness.

Everyone remembers the ringing words of Father Vimont, regarding the new settlement of Ville-Marie, as he stood by the side of Maisonneuve, that morning of May 18, 1842, when the little band of religious enthusiasts landed at the spot now occupied by the Customs House: "You are a grain of mustard seed that shall rise and grow till its branches overshadow the earth." There is no question today that the prophecy of the good Jesuit has been amply fulfilled. Montreal is today one of the outstanding cities, not only on this continent, but in the entire world. Covered by two great races as by two powerful streams which, like the Arctusa and the Adriatic sea of old, may not mingle their waters, but none the less flow together and peaceably toward the same ocean of progress, Montreal, with its population of over a million, possesses that peculiarity of being at the same time the second largest city in the British Empire and the second largest French city in the world. It already attracts universal attention by its ever increasing commercial power and by its constantly renewed spirit of enterprise. In the light of its past achievement, it is impossible to foretell where it will stop and we can only watch it grow.

ASSOCIATION NEWS

WESTERN BRANCH A. P. H. A.

THE Second Annual Meeting of the Western Branch, American Public Health Association, was held at Seattle from May 28 to 30. The meeting was called to order by President Hassler at 10 o'clock on the morning of May 28 at the Hotel Olympic. Dr. Hassler delivered a masterly annual address, discussing with vigor a number of particularly live questions of public health interest.

The scientific meetings continued throughout the three days. Papers were of an exceptionally high grade and the program admirably balanced. Appreciation of the excellence of the material presented was shown by the fact that all sessions were fully attended and the audience remained to the end of the meetings, with very little of the usual interruption caused by individuals coming and going during the reading of papers.

The arrangements made by the En-

tertainment Committee, headed by Mrs. C. B. W. Raymond with Mrs. J. W. Hyneman as Vice-Chairman, had made provision for delightful sight-seeing and social events which added much to the complete success of the meeting.

Every credit is due Dr. William P. Shepard, Secretary of the Western Branch, for the completeness of the arrangements made by him in planning the meeting.

Dr. E. T. Hanley, Health Commissioner of Seattle, Wash., was elected President of the Western Branch for the coming year; the three Vice-Presidents elected are Dr. A. L. Beaghler of Denver, Colo., Dr. H. W. Hill of Vancouver, B. C., and Dr. Walter Brown of Stanford University, Calif.; Dr. William P. Shepard of San Francisco, Calif., was reelected Secretary, with W. F. Higby of San Francisco as Treasurer.

The Annual Meeting next year will be held in Denver, Colo.

THINGS OF INTEREST ABOUT THE 60TH ANNUAL MEETING CITY—MONTREAL

In 1535 Jacques-Cartier, sailing up the mighty St. Lawrence, came upon a large fortified Indian village. This Indian village marks the site of a part of present-day Montreal.

Champlain in 1611 established in Montreal a trading post, and in 1642 Paul de Chomedey, Sieur de Maisonneuve, founded the city proper.

Montreal remained under French rule until 1763, when Canada became an English possession under the treaty of Paris.

Montreal has over 250 public schools, which are bilingual, i.e., teaching both French and English languages from the earliest grades.

About 75 per cent of the inhabitants of Montreal are of French origin, which with English, Canadian and American or other nationalities makes it so cosmopolitan in character and so interesting to tourists.

Mount Royal Park in the center of the city has beautiful drives along typical mountain roads to the summit, and

is about 600 feet from the sea level, consisting of approximately 550 acres. Automobiles are not permitted. From the summit a magnificent view is to be had of the city, the harbor and River St. Lawrence, and a distant outline of the Adirondack Mountains.

Montreal, the most important city in Canada, is a thousand miles from the sea, one of the greatest inland ports in the world, and is the national seaport of Canada.

At Montreal terminates the great canal system which brings the water traffic from the West as far as from the head of Lake Superior.

Montreal is the terminus and headquarters of the Canadian Pacific and Canadian National Railways, two of the largest railroads in the world (which are both Transcontinental Lines).

CUSTOMS REGULATIONS

1. The law requires that every person entering the United States shall make a declaration and entry of personal baggage. The senior member of a family present as passenger may, however, declare for the entire family.

(a) Returning residents of the United States must declare all articles acquired abroad, in their baggage or on their persons, whether by purchase, by gift, or otherwise, and whether dutiable or free of duty. Exemption, however, will be allowed by customs officers of articles aggregating not over \$100 in value, if suitable for personal or household use, or as souvenirs or curios, and whether intended for the personal use of the passengers or as gifts or presents to others, provided the articles are not bought on commission for another person nor intended for sale. Articles so exempt from duties must, nevertheless, be declared.

(d) Passengers must not deduct \$100 exemption in making out their declaration. Such deductions will be made by Customs Officers.

Each passenger over 18 years of age may bring in free of duty 50 cigars or 300 cigarettes, or smoking tobacco not exceeding three pounds if for the bona fide use of such passenger. These articles must be declared, but will be passed free by Customs Officers in addition to the \$100 exemption.

(b) The offering of gratuities or bribes to Customs Officers is a violation of law.

6. All articles acquired abroad should be packed, whenever possible, in one receptacle. This will save trouble and inconvenience at time of examination.

(b) United States Customs Officers are located at Windsor and Bonaventure stations. Baggage not examined at these points will be forwarded to destination, if such is a bond port, for examination. If destination is not a bond port, inspection will be made at the frontier.

MEXICAN ANNOUNCEMENT OF A. P. H. A. MEETING

In an editorial in the March issue of *Ingenieria (Publicacion Mensual Organo de la Facultad Nacional de Ingenieros, Mexico)*, the value of meetings such as that of the A. P. H. A. in Montreal is stressed. In particular attention is called to the value of coöperation between the physician and engineer:

The doctor studies, with the aid of his knowledge of diseases, the physiological effects of the many factors which exist in a modern city. He then gives his decision and the remedy. . . . It is not in his power to prevent the cause when it is due to the physical medium in which we live. The engineer completes the task of the doctor. . . . With the aid of his knowledge he designs well conditioned and safe projects in accord with the recommendations afforded by medical science and thus destroys the root of such evil conditions. . . .

Medicine and engineering are the two professions which extend the protecting wings over disease stricken humanity. Their mutual help, their open coöperation, will give us a means for effective welfare. . . .

The American Public Health Association contributes to the realization of this end. It works in order to obtain the scientific ideals which guarantee healthful living conditions. We are proud to place on the first page of this issue the announcement of its future meeting and send our cordial greetings for the success which we are sure it will obtain.

APPLICANTS FOR FELLOWSHIP

LABORATORY SECTION: John W. M. Bunker, Ph.D., Cambridge, Mass.; Lawrence T. Clark, Detroit, Mich.; Henry G. Dunham, Detroit, Mich.; Leon C. Havens, M.D., Montgomery, Ala.; Theodore W. Kemmerer, M.D., Jackson, Miss.; Pearl Kendrick, Grand Rapids, Mich.

PUBLIC HEALTH ENGINEERING SECTION: Aime Cousineau, C.E., Montreal, Que.; Warren J. Scott, Hartford, Conn.; Ellis S. Tisdale, Charleston, W. Va.

PUBLIC HEALTH EDUCATION SECTION: William H. Eaton, M.D., Santa Barbara, Calif.; Clair Van N. Langton, D.P.H., Corvallis, Ore.; Jessie I. Lummis, Denver, Colo.; Richard G. Soutar, Jr., M.D., Sacramento, Calif.

PUBLIC HEALTH NURSING SECTION: Mary A. Brownell, R.N., New York, N. Y.; Mary C. Dickerman, R.N., New York, N. Y.; Anna Heisler, R.N., St. Louis, Mo.; Bertha O. Yenicek, R.N., St. Louis, Mo.

UNAFFILIATED: Harry E. Foster, M.D., Berkeley, Calif.; Wilfred H. Kellogg, M.D., Berkeley, Calif.; Ida M. Stevens, Berkeley, Calif.

NEW MEMBERS

The following list includes applicants who have been approved for membership in the A. P. H. A. by the Sub-committee on Eligibility. These new members have requested affiliation with the sections indicated, and action by the Section Council will follow.

Health Officers Section

Gregoire F. Amyot, M.D., D.P.H., N. Vancouver, B. C., Director of Health Unit
Margaret M. Bullard, M.D., King City, Calif., Deputy County Health Officer
Wheeler Davis, M.D., Kennett, Mo., County Health Officer
R. M. Fortier, M.D., Salinas, Calif., Health Officer, Monterey County
William G. C. Hill, M.D., Moundsville, W. Va., Marshall County Health Director
Gustave Lacasse, Tecumseh, Ont., President, Ontario Medical Health Officers Assn.
Francis M. A. McNaughton, M.D., Westmount, P. Que., Health Officer
Roscoe L. Mitchell, M.D., Lewiston, Me., District Health Officer
R. L. Wright, M.D., Poteau, Okla., County Supt. of Health

Laboratory Section

Eudore Giguere, B.A.Sc., Montreal, P. Que., Chief Chemist, Dept. of Health
Louis-Philippe Lebeau, M.D., Montreal, P. Que., Bacteriologist, Provincial Bur. of Health

Vital Statistics Section

Reuben Kaznelson, Ph.D., B.S., Jerusalem, Palestine, Asst. Director, Hadassah General Organization (Assoc.)

Public Health Engineering Section

Herbert M. Bosch, B.S., Jefferson City, Mo., Asst. Public Health Engineer, State Board of Health
Jorge V. Davila, B.S., M.S., Santurce, P. R., Engineer charge of water and sewage purification, Dept. of Health
E. X. Jones, New York, N. Y. (Assoc.)
John L. Oberly, B.S., Chicago, Ill., Ventilation Engineer in charge, City Health Dept.
Frank W. Stock, Stamford, Conn., Nustone Products Corp.

Industrial Hygiene Section

John W. Dugger, M.D., Jackson, Miss., Director, Bur. of Industrial Hygiene
Austin D. Reiley, New York, N. Y., Supervisor of Risks, Mutual Life Ins. Co.

Food, Drugs & Nutrition Section

Jean V. Knapp, D.V.M., Tallahassee, Fla., State Veterinarian
Lillias D. Lund, B.S., Fort Wingate, New Mex., Teacher of Home Economics, U. S. Dept. of Interior, Office of Indian Affairs

Public Health Education Section

Joseph A. Baudouin, M.D., Montreal, P. Que., Professor of Hygiene and Public Health, Univ. of Montreal

Mary E. Elliott, Cambridge, Mass., temporarily student at Simmons College, connected with Walla Walla Health Center
 Abraham J. Levy, Ph.D., M.D., New Haven, Conn., Fellow of Hadassah (Assoc.)
 Louise E. Northup, B.S., Harrisburg, Pa., Director, Health Education Service, Penn Milk Products Co.

Public Health Nursing Section

Lillian Goodall, Ann Arbor, Mich., Student (Assoc.)
 Edna J. Keller, R.N., Dyersburg, Tenn., Dyer County Health Nurse
 Edith Ross, R.N., Van Buren, Mo., Chief Nurse, District Health Dept.
 Mrs. Bertha Stevens, R.N., Springfield, Mo., County Public Health Nurse

Olive M. Whitlock, R.N., Rockport, Mo., County Public Health Nurse
 Dorothy I. Willis, R.N., Boonville, Mo., County Public Health Nurse

Epidemiology Section

Benjamin G. Horning, W. Hartford, Conn., Epidemiologist
 Horace G. MacKerrow, M.D., Worcester, Mass., Tuberculosis Sanitarium
 Elzear Pelletier, M.D., Montreal, P. Que., Consulting Hygienist, Provincial Bur. of Health

Unaffiliated

John W. Armstrong, M.D., Berea, Ky., College Physician, Berea College

MONTREAL HOTEL RATES

Hotel	Room Capacity	Single Room		Double Room	
		Without Bath	With Bath	Without Bath	With Bath
de la Salle.....	150	....	\$3 00-\$5.00	....	\$4.00-\$6.00
Ford.....	750	\$1.50-\$2.25	\$2.50	\$3.00-\$4.50	\$5.00-\$6.00
Mount Royal.....	1,100	....	\$4.00	....	\$7.00
Place Viger.....	125	\$3.00	\$4.00	\$5.00	\$7.00
Queen's.....	500	\$3.00-\$3.50	\$4.00-\$5.00	\$6.00	\$7.00-\$10.00
Ritz-Carlton.....	250	....	\$6.00	....	\$10.00-\$12.00
Windsor.....	750	....	\$4.50	....	\$8.00

.....(Cut off on this line and mail to the hotel of your choice.).....

HOTEL RESERVATION BLANK FOR MONTREAL MEETING

AMERICAN PUBLIC HEALTH ASSOCIATION

SEPTEMBER 14-17, 1931.

To.....
 (Name of Hotel)

Please reserve for me.....rooms for.....persons
 for the A. P. H. A. Meeting. (Cross [X] is placed after my preference.)

Single room.....Double room.....

Maximum rate per day for room \$......Minimum rate per day for room \$.....

I expect to arrive..... If date of arrival is changed I will notify
 you at least 24 hours in advance.

Please acknowledge this reservation.

Name.....

Street Address.....

City..... State.....

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Kansas City's Health—The Chamber of Commerce of Kansas City has sponsored a survey of the health and hospital situation, the study being reported in 3 major divisions: (1) the public health services of the voluntary and tax supported agencies, (2) community aspects of hospital facilities, (3) the administration of the city hospital group.

The application of the *Appraisal Form* of the American Public Health Association indicates that the health services are somewhat less than 70 per cent of the standard. This deficiency is ascribed to the lack of stability and leadership existing in the official health department in the past. There is need of the establishment of a nonpartisan health department. There is now being expended \$1.39 per capita from official and unofficial sources. The leadership in Kansas City has come from the voluntary groups working so far as possible with the official agencies concerned.

There are three groups providing public health nursing service in Kansas City. The Health Department has but 5 nurses while the Board of Education employs 52, and the Visiting Nurse Association 55. Many of the functions of the latter are unquestioned responsibilities of the Health Department, such as the tuberculosis and child welfare services. Complete generalization of nursing service is recommended for consideration in order to secure economy of operation.

Less than one-half of the milk supply is safeguarded by pasteurization. Health education has been carried on

by the Health Conservation Association through affiliated and coöperative agencies and the Children's Bureau.—Health and Hospital Survey of Kansas City, Mo., Kansas City Chamber of Commerce, 1931.

County Health Program—There are at least four factors to be considered in a well balanced rural health program: first, the local problems should be well defined; second, available resources must be made to fit in with local problems; third, the *Appraisal Form* should be used to assist in distributing local effort to meet the various needs of a well rounded health program; fourth, a planned work program will aid in carrying out the proposed program.—F. L. Roberts, *Pub. Health Rep.*, 46, 1079 (May 8), 1931.

Tuberculosis Control in New York State—There were reported in upstate New York in 1930, 7,904 new cases of tuberculosis and 3,844 deaths from this disease. Of 7,216 pulmonary cases reported, 20 per cent were in the minimal stage, 25 per cent moderately advanced, and 33 per cent advanced. There is need of a greater appreciation of the value of diagnostic laboratory service as indicated by the fact that 57 per cent of the cases contained no information regarding examination of sputum.

The State Health Department maintains an itinerant chest clinic at which 5,588 patients were examined, 63 per cent of whom were new cases. Fifty thousand patients were examined during the year at 63 local clinics.—*Health*

News, New York State Dept. of Health, 8, 78 (May 18), 1931.

Whooping Cough in Maryland—During the period 1921–1929 inclusive, there were reported in Maryland 34,238 cases and 1,484 deaths from whooping cough. Baltimore reported 25,062 of these cases. Case reporting is less complete in the rural sections where 56 per cent of the deaths occurred and only 27 per cent of the cases was reported. The loss of time due to illness from whooping cough is not generally appreciated. As the Maryland quarantine period is 30 days, during the period of the study there were 1,027,140 sick days or an average of 3,804 months lost during each year. There has been a slight downward trend in the death rate from whooping cough. The mean rate for

the period 1906–1914 was 16.4 per 100,000 population, while the mean rate for the last 9 years was 10.7.—John Collinson, Whooping Cough in Maryland, *Bull.*, Maryland State Dept. of Health, 1931.

Cleveland Census Tracts—A book has been prepared to present basic population data for Cleveland and to carry a street index which makes possible a geographical distribution of all sorts of statistical units. Such a volume is of great help to all who need population facts, especially dealing with problems of public and private health and for the improvement of social and living conditions.—Howard W. Green, *Population by Census Tracts, Cleveland and Vicinity*, Cleveland Health Council, 1931.

LABORATORY

JOHN F. NORTON, PH. D.

PROPOSED CHANGES IN STANDARD METHODS OF WATER ANALYSIS

AT the meeting of the Committee on Standard Methods of the Laboratory Section of the American Public Health Association at Fort Worth, October 29, 1930, certain changes in methods were recommended in addition to those previously recommended and published in the *Journal* for January, 1930. These changes were approved by the referees involved, and are presented here in order that the members of the Association may have full information and opportunity to comment if they so desire. This report contains the complete description of proposed Standard Methods for the determination of turbidity of

soap hardness to replace those in use at present; a summary of methods for the rapid analysis of water to be used for boiler purposes, these methods being new material as far as "Standard Methods" is concerned but representing what is believed to be the best current practice; and a proposed bacterial method using brilliant green lactose bile medium. Other less important and to a large extent editorial changes will be indicated.

Atomic weights have been brought up to date and necessary corrections made in chemical factors.

The following method is recommended

for the measurement of turbidity: The removal of suspended matter by centrifugating before determination of color is recommended for turbid waters.

The turbidity of water is due to suspended matter, such as clay, silt, finely divided organic matter, microscopic organisms, and similar material.

I. TURBIDITY MEASUREMENTS

Turbidity measurements are based on the depth of solution required for the image of the flame of a standard candle to disappear when observed through the solution. The standard instrument for making such measurements shall be the Jackson candle turbidimeter, which consists of a graduated glass tube, a standard candle, and a support for the candle and tube. The glass tube and the candle shall be supported in a vertical position so that the center line of the tube passes through the center line of the candle, the top of the support for the candle being 7.6 cm. (3 inches) below the bottom of the tube. The glass tube shall be graduated, preferably to read direct in turbidities, and shall have a flat polished bottom. Most of the tube should be enclosed in a metal or other suitable case when observations are being made. The candle support shall have a spring or other device so as to keep the top of the candle pressed against the top of the support. The candle shall be made of beeswax and spermaceti gauged to burn within the limits of 114 to 126 gr. per hour.

To insure uniform results it is desirable that the flame be kept as near constant size and a constant distance below the glass tube as is possible. This will require frequent trimming of the charred portion of the candle string and frequent observations to see that the candle is pushed to the top of its support. Each time before lighting the candle remove such portion of the charred part of the string as is very easily broken off with the fingers. Do not keep the candle lighted for more than a few minutes at a time, for the flame has a tendency to increase in size.

The observation is made by pouring the solution into the glass tube until the image of the candle flame just disappears from view. Pour slowly when the candle becomes only faintly visible. After the image has disappeared the removal of 1 per cent of the solution from the tube should make it again visible. Care should be taken to keep the glass tube clean on both the inside and the outside. The accumulation of soot or moisture on the lower side of the glass bottom of the tube may interfere with the accuracy of the results.

The figures in Table I give the turbidities for the depth at which the image of the candle just disappears.

TABLE I

GRADUATION OF CANDLE TURBIDIMETER				
Depth of Liquid (cm.)	Turbidity	Depth of Liquid (cm.)	Turbidity	
2.3	1,000	10.3	200	
2.6	900	10.8	210	
2.9	800			
3.2	700	11.4	190	
3.5	650	12.0	180	
		12.7	170	
3.8	600	13.5	160	
4.1	550	14.4	150	
4.5	500			
4.9	450	15.4	140	
5.5	400	16.6	130	
		18.0	120	
5.6	390	19.6	110	
5.8	380	21.5	100	
5.9	370			
6.1	360	22.6	95	
6.3	350	23.8	90	
		25.1	85	
6.4	340	26.5	80	
6.6	330	28.1	75	
6.8	320			
7.0	310	29.8	70	
7.3	300	31.8	65	
		34.1	60	
7.5	290	36.7	55	
7.8	280	39.8	50	
8.1	270			
8.4	260	43.5	45	
8.7	250	48.1	40	
		54.0	35	
9.1	240	61.8	30	
9.5	230	72.9	25	
9.9	220			

Observations should be made in a darkened room or with a black cloth over the head. It is allowable to substitute for the standard candle other forms of light, but the instrument must be calibrated to give turbidity readings that correspond with the standard candle.

II. TURBIDITY MEASUREMENTS BELOW 25

It is evident that the candle turbidimeter cannot be used for the direct measurement of low turbidities. When the turbidity is below 25 it is better to make the determinations by comparing with standards of known turbidity. For turbidities between 5 and 25, approximate results may be obtained by comparing in bottles with standards of known turbidity. Below 5, it is better to use some kind of an

instrument especially designed for low turbidity comparisons such as the Baylis turbidimeter.¹

Preparation of Standards—Add 2 or 3 gm. of fuller's earth to about 1 liter of distilled water, thoroughly agitate several times within a period of 1 hour, and then allow to stand about 24 hours. Withdraw part of the supernatant liquid without disturbing the sediment on the bottom, and test the turbidity with the Jackson candle turbidimeter. If the turbidity is less than 25, add more earth, allow to stand an additional 24 hours, and repeat the testing until a turbidity of at least 25 is obtained. It is better to use an amount of the earth that will give a turbidity less than 50. This constitutes the stock solution, which will remain in fairly good condition for several months. Before using the stock solution for making turbidity standards thoroughly agitate and make a turbidity measurement with the candle turbidimeter. The turbidity may change slightly on standing.

Dilute portions of the stock solution to the desired standards with zero-turbidity distilled water. For turbidity readings between 5 and 25, standards of 5, 10, 15, 20, and 25 may be prepared. Turbidities between zero and 2.0 may be measured by comparing the standards in the Baylis turbidimeter. To cover this range, standards of 0.1, 0.2, 0.4, 0.6, 0.8, 1.0, 1.2, 1.4, 1.6, 1.8, and 2.0 should be prepared. The quantity of stock solution required to prepare a certain standard is the volume of the standard multiplied by the desired turbidity and this divided by the turbidity of the stock solution. If the stock solution has a turbidity of 30 and it is desired to prepare 500 c.c. of 0.6 turbidity, (500×0.6) divided by 30 gives 10 c.c. of the stock solution.

Procedure—When the turbidity is between 5 and 25 approximate determinations may be made by comparing the samples in bottles with standards of known turbidity. This should be done in clear glass bottles, preferably of 1 liter capacity or greater. The comparison shall be made by viewing both sample and standard sidewise, looking at some object and noting the distinctness with which the margins of the object can be seen. The standards shall be kept stoppered, and both standard and sample shall be thoroughly shaken before making the comparison. The standards should be made fresh at least every month. In order to prevent any bacterial or algal growths from developing a small amount of mercuric chloride may be added to the standards.

For making turbidity measurements between 0.0 and 2.0 with the Baylis turbidimeter, fill

one of the long glass tubes with the water to be tested. Allow to stand until all air bubbles rise to the surface, which is usually between 5 and 10 minutes. Observe the sample before filling the other tube with a standard of known turbidity and make a guess at the turbidity. Use the standard nearest the guess, and when the air bubbles have disappeared from the standard, which is usually between 1 and 2 minutes, make a comparison. If the sample varies from the standard, use another standard and continue until the one nearest that of the sample is found. Standards standing in the glass tube more than 2 or 3 hours should be thoroughly agitated before making a comparison. Keep the glass tubes filled with water above the line where the light strikes the tube; otherwise corrosion of the glass at the water line may interfere with the results. The glass tubes should be kept clean on both the inside and outside. Do not handle the tubes below the line where the light strikes them.

Turbidities between 2.0 and 5.0 shall be made by diluting the sample with zero-turbidity distilled water to a turbidity less than 2.0 and comparing in the Baylis turbidimeter, or the test shall be made by the use of some instrument designed for turbidity comparisons that will give accurate results.

Turbidities between 5 and 25 also may be diluted below 2.0 for comparison in the Baylis turbidimeter, unless a more accurate method than comparison in bottles is available. Direct observation in color comparison tubes gives fairly good results when the color is less than 10.

The results of turbidity observations shall be expressed in numbers which correspond to units of turbidity as follows:

Turbidities	0.0 and	5.0 recorded	to the nearest	tenth
"	5	50	"	unit
"	51	100	"	5
"	101	500	"	10
"	501	1,000	"	50
"	1,001	greater	"	100

III. COEFFICIENT OF FINENESS²

The quotient obtained by dividing the weight of suspended matter in the sample by the turbidity, both expressed in the same units, shall be called the coefficient of fineness. The samples shall be filtered through a fine

REFERENCES

1. Baylis, John R. Turbidimeter for accurate measurement of low turbidities, *Indust. & Eng. Chem.*, 18, 3: 311 (Mar.), 1926.
2. Report of Committee on Standard Methods of Water Analysis, *Pub. Health Reports & Papers (Transactions of the A. P. H. A.)*, XXVII (1901), pp. 377-391.

alundum crucible or some suitable filter that will remove all the suspended matter. The crucible shall then be dried to constant weight in an oven at 110° C.

For waters high in organic matter, a temperature of 103° C. is recommended for the drying of solids.

The following method is recommended for the determination of hardness by the use of standard soap solution.

REAGENTS

1. *Standard Calcium Chloride Solution*—Dissolve 0.5 gm. of pure calcite (calcium carbonate) with a little dilute hydrochloric acid, being careful to avoid spattering. Wash down with carbon dioxide free distilled water and neutralize with ammonium hydroxide to slight alkalinity, using litmus as an indicator. Make up to 500 c.c. with carbon dioxide free distilled water and store in glass stoppered bottle. One c.c. of this solution is equivalent to 1 mg. calcium carbonate.

2. *Standard Soap Solution*—Make up stock solution by shaking vigorously approximately 100 gm. of pure powdered castile soap in 1 liter of 80 per cent grain alcohol. Let this solution stand at least over night and decant. Titrate against the CaCl_2 solution and dilute with 70 per cent grain alcohol until 1 c.c. of the resulting solution is equivalent to 1 c.c. of the standard calcium chloride solution, making due and recorded allowance for a lather factor from at least five determinations. The lather factor will vary from 0.5 to 1.4 c.c. with different soaps. Carbon dioxide free water should be used for lather factor determinations and standardization of the solution. One c.c. of this solution after subtracting the lather factor is equivalent to 1 mg. calcium carbonate.

3. N/50 sulphuric acid
4. N/50 sodium carbonate
5. Phenolphthalein indicator
6. Methyl orange indicator

ANALYTICAL PROCEDURE

1. *Hardness*—Measure 50 c.c. of the water to be examined into an 8-oz. bottle. Add the standard soap solution in small amounts at a time, shaking vigorously after each addition, until a strong permanent lather is secured which will stand for 5 minutes. It is usually satisfactory to add an amount of soap solution equal to the lather factor as the first addition and then, as the end point is approached, to cut the additions of soap solution to 0.1 c.c. or more, depending upon the

accuracy desired and the experience of the manipulator. Note and record any false end point which is the dividing line between the calcium and magnesium salts. The final burette reading, after deducting the lather factor, gives the total hardness ("H") in terms of calcium carbonate as p.p.m. when multiplied by 20. (In determining the hardness of acid waters they should first be rendered neutral to methyl orange by addition of N/50 sodium carbonate solution. Samples containing appreciable amounts of free carbon dioxide should be neutralized to faint pink with N/50 normal sodium carbonate solution before testing.) The difference between the false end point and the total hardness indicates the amount of magnesium salts, the balance being calcium salts, all, when multiplied by 20, expressed as p.p.m. in terms of calcium carbonate. If the hardness test requires more than 7.5 c.c. of soap solution, it is best to take an aliquot portion and dilute to 50 c.c. with carbon dioxide free distilled water so that the final lather point will be less than 7.5 c.c. After deduction of the lather factor, multiply the result accordingly to obtain correct hardness value.

(NOTE: If it is desired to express results in terms of gr. per gal. use a 58.3 c.c. sample of water and the results can be read direct as gr. per gal. in terms of calcium carbonate after subtracting the lather factor.)

For field work, the following solution and method is recommended.

Dissolve 100 gm. of pure soap in 1,600 c.c. of 90 per cent grain alcohol. Dilute with distilled water (800 to 1,000 c.c. will be required) until 2.4 c.c. of the soap solution gives a lather with 40 c.c. of a solution of CaCl_2 containing 0.25 gm. per liter. The CaCl_2 solution may be made up by dissolving the proper amount of pure CaCO_3 , using the technic described above (see standard soap).

This soap solution is approximately $3\frac{1}{2}$ times as strong as the standard soap previously described and is to be used for field determinations of "zero hardness." For this purpose 40 c.c. of the water to be tested are placed in a 3-oz. cork stoppered bottle and the soap solution added a drop at a time from any convenient type of dropping bottle which delivers 0.05 c.c. per drop. The sample is shaken vigorously after each addition of soap. Three drops should give a permanent lather with 40 c.c. of distilled water or water of "zero hardness."

Directions for titration with erythrosine have been modified.

The drop ratio method for the determination of hydrogen ion concentration has been omitted. It is recommended that the results of mineral analysis be expressed in p.p.m. and milli-equivalents.

The following colorimetric method for the determination of silica is suggested.

REAGENTS

1. Ammonium molybdate reagent:
30 gm. of ammonium molybdate
200 c.c. of 1:1 HCl
400 c.c. of water
2. Standards:
0.530 K_2CrO_4 in 100 c.c. water
1 c.c. of this solution is equivalent to 1 mg. SiO_2 .
Permanent standards reading directly in p.p.m. when a 50 c.c. sample is used may be made as follows:

c.c. of chromate diluted to 55 c.c.	Equivalence in p p m. SiO_2 when 50 c.c. sample used
0.0	0
0.1	2
0.2	4
0.3	6
0.4	8
0.5	10
0.6	12
0.7	14
0.8	16
0.9	18
1.0	20
1.1	22
1.2	24
1.3	26
1.4	28
1.5	30

Procedure—Fifty c.c. of the sample are measured into a tall form Nessler tube. Five c.c. of the molybdate reagent are added. The mixture is thoroughly shaken and allowed to stand about 15 minutes—not longer than 20 minutes. The yellow color developed is then compared with the chromate standards.

The limitations of this method are:

1. It will not determine suspended silica.
2. Phosphates interfere.
3. Strong mineral acids in excess of that present in the reagent will prevent the development of maximum color.
4. Hydrogen sulphide gives a blue color instead of yellow and must therefore be removed.

This method was suggested by L. W. Winkler¹ and modified in the Illinois State Water Survey laboratory by S. L. Neave.²

Slight modifications have been suggested in the descriptions for the determination of total and suspended solids and of grease.

A report has been prepared by R. C. Bardwell recommending Rapid Methods for the Analysis of Boiler Waters. These methods include both those for field and for laboratory work. They are not given here in full because they represent well recognized procedures. However, a copy giving the complete details can be obtained from the Secretary of the Committee.

A brief summary of these methods is as follows: It is recommended that combinations of positive radicals should be made with negative radicals in the following order when it is desired to report the results in hypothetical combinations.

Positive Radicals	Negative Radicals
Calcium	Carbonate
Magnesium	Sulphate
Potassium	Chloride
Sodium	Nitrate

Total hardness is determined by means of soap solutions. Alkalinity and acidity are determined by titration with N/50 sulphuric acid and N/50 sodium carbonate respectively, using methyl orange as an indicator. Non-carbonate hardness is determined by means of soda reagent and a volumetric procedure of magnesium is given.

The following method for the determination of *B. coli* by means of brilliant green lactose peptone bile medium is recommended with the proviso that it be used only for water purification plant control.

BRILLIANT GREEN LACTOSE PEPTONE BILE

This medium may be used for parallel planting with standard lactose broth, for water purification plant control, only. It contains brilliant green in a concentration of 1:75,000 and 2 per cent of bile.

REFERENCES

1. *Ztschr. f. anal. Chem.*, 54: 365, 1914.
2. Not published.

Dissolve 10 gm. of peptone and 10 gm. of lactose in 500 ml. of distilled water. Add 200 ml. of fresh ox bile (or 20 gm. of dehydrated bile) and 13.3 ml. of a 0.1 per cent solution of brilliant green (certified dye) in water. Make up to a volume of 1,000 ml. with distilled water, adjust the reaction to a pH of 7.1-7.4 and filter through cotton. Distribute in tubes with inverted vials and sterilize as directed under sterilization. The reaction after sterilization should be 7.1-7.4.

When 10 ml. or more of water are to be planted, the concentration of ingredients should be increased as indicated in the following table:

Amount of Water Sample	Concentration of Ingredients per 1,000 ml. of medium	Amount of medium per tube
1 ml. or less	peptone, 10 gm. lactose, 10 gm. ox bile, 200 ml. brilliant green, 0.1% solution, 13.3 ml.	10 ml.
10 ml. or 100 ml.	peptone, 20 gm. lactose, 20 gm. ox bile, 400 ml. brilliant green, 0.1% solution, 26.6 ml.	10 ml. or 100 ml.

Amount of Water Sample	Concentration of Ingredients per 1,000 ml. of medium	Amount of medium per tube
10 ml.	peptone, 15 gm. lactose, 15 gm. ox bile, 300 ml. brilliant green, 0.1% solution, 20 ml.	20 ml.
10 ml.	peptone, 13.3 gm. lactose, 13.3 gm. ox bile, 266.6 ml. brilliant green, 0.1% solution, 17.7 ml.	30 ml.

The medium may be used in the dehydrated form in the following concentrations:

Amount of Water Sample	Concentration of Ingredients per 1,000 ml. of medium	Amount of medium per tube
1 ml. or less	40 gm.	10 ml.
10 ml. or 100 ml.	80 gm.	10 ml. or 100 ml.
10 ml.	60 gm.	20 ml.
10 ml.	53 gm.	30 ml.

(To be continued)

PRESERVATION OF HEMOLYTIC AMBOCEPTOR

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THE usual method of the preservation of hemolytic amboceptor is by addition of 50 per cent of sterile neutral glycerin. Phenol 0.4 per cent, and tricresol 0.3 per cent have also been used. It is common experience that the titer of such preserved amboceptor slowly decreases, and it is customary to retest it about every 3 months.

The use of mercuric chloride as a desirable preservative, advocated by Daranyi, warrants consideration. Daranyi prepared a "stock solution of corrosive sublimate; 1.0 gm. of mercuric chloride is dissolved in 250 c.c. of physiological salt solution. Of this solution, 1/20 part by volume is to be

mixed quickly with the serum. The corrosive sublimate is present in the serum in a final dilution of 1:5,000

TABLE I
COMPARISON OF TITER OF HEMOLYTIC AMBOCEPTOR ACCORDING TO KIND OF PRESERVATIVE

Hemolytic Amboceptor	Pre-servative	Titer			Ap-pearance
		Mar. 1929	May. 1930	May. 1931	
	Glycerin	1:2,000	1:1,200	1:600	Slight cloudiness
	Hg-Cl ₂ 0.02%	1:2,000	1:1,700	1:800	Clear

(0.02 per cent)." In serum preserved by the mercuric chloride method, Daranyi found after a half year no diminution of titer.

I divided a fresh supply of hemolytic amboceptor, attenuated, into two portions, according to Table I.

In this particular experiment, the titer of the corrosive sublimated amboceptor decreased more slowly than the glycerinated amboceptor, especially during the

first year. HgCl_2 appears to be a desirable preservative for hemolytic amboceptor.

BIBLIOGRAPHY

1. Gilbert, Ruth. Production of Antisheep Amboceptor in a Mule, New York State *J. Med.*, 22: 286, 1922.
2. Kolmer and Boerner. *Laboratory Diagnostic Methods*, 1925.
3. Daranyi, J. Methods of Obtaining and Preserving Antibodies, *J. Immunol.*, Vol. 15, Nov., 1928.
4. *Manual of Methods for Pure Culture Study of Bacteria*. Society of American Bacteriologists, 1930.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Vital Statistics for Kentucky, 1930—For the state of Kentucky the general death rate in 1930, of 11.3 per 1,000 population, is 0.8 lower than in 1929. There were 1,324 fewer deaths than in the previous year. The causes from which the number of deaths increased in 1930 were meningitis, measles, typhoid fever, infantile diarrhea, diarrhea in adults, infantile paralysis, malaria and cancer. With the probable exception of meningitis the increased rate from the other causes is undoubtedly due to the drought conditions existent in the state. There were 2,468 deaths from tuberculosis, with a rate of 94.4, as against 2,654, with a rate of 103.9 in 1929. This is the first time since enactment of the vital statistics law in 1910 that the tuberculosis rate has fallen below 100.0. Eight hundred deaths were attributed to influenza; 3,239 resulted from this cause in 1929. Cancer deaths increased 213 over the previous year, showing a rate in 1930 of 68.4. The number of births registered increased 283 over 1929, but due to increase in the recorded population, the rate is somewhat lower, being 21.8 as

against 22.2 in 1929. The infant mortality rate of 66.5 is the second lowest ever recorded in the state.—*Bull.*, State Board of Health of Kentucky, 3: 5 (Apr.), 1931.

Vital Statistics for New Jersey, 1930—The lowest general death rate, tuberculosis death rate and infant mortality rate ever attained in New Jersey were reached in 1930. Preliminary rates, subject to slight corrections, show that the state death rate for 1930 was 10.63 per 1,000 estimated population. This was the lowest rate ever attained in New Jersey, the previous low being 11.43 in 1927. The estimated midyear population for 1930 was 4,062,930. The rate from all forms of tuberculosis was 69.0 per 100,000 population, which compared favorably with a rate of 90.1 from the same disease only 7 years ago. The death rate from cancer and other malignant tumors, 106.6, was lower than the 1929 rate of 116.4. The latter was the highest ever recorded in New Jersey. The pneumonias showed a decreased rate. For 1929 the rate was 109.5 per 100,000 population and for 1930, 77.4.

Approximately 68,200 births were reported as occurring in 1930, which was equivalent to a rate of 16.79 per 1,000 inhabitants. The low figure for 1930 was merely a continuance of the decline noted since 1917, when the rate was 24.98. The number of deaths of infants under 1 year of age per 1,000 babies born alive was 56.7, which was the lowest infant mortality rate in New Jersey since such rates were first published in 1906. The approximate number of mothers who died as a result of childbirth was 390, or 5.7 per 1,000 babies born alive. This compared with 5.3 for the preceding year.—*Pub. Health News*, New Jersey State Dept. of Health, 16: 85 (Mar.), 1931.

Marriages in New York State—1930—The marriage rate in the state of New York in 1930 was, with the single exception of 1908, the lowest recorded in the last 30 years. The number of marriages was 108,498 and the marriage rate 17.2 per 1,000 population as compared with 114,644 marriages and a rate of 18.4 in 1929.

It is a well known fact that the marriage rate fluctuates in direct response to important sociological and economic phenomena. The financial panic of 1907 was reflected the following year in a drop in the marriage rate of 22 per cent—the greatest ever recorded in the state. Our entrance into the World War was the primary cause for the low rate in 1918, which was 14 per cent below that of the preceding year. The highest rate for the state (21.6) was recorded in 1920—the marriages in that year including undoubtedly many that were postponed because of war conditions. The second highest rate (21.5) was that of 1907—the third successive year of unusually favorable business conditions preceding the panic in the last quarter of that year and the depression of 1908. The exceptionally low rate of 1930 is a direct consequence

of the widespread economic depression which first manifested itself in the late fall of 1929.

The marriage rate according to age had a low point at the youngest age rising to a maximum at 21 years for both brides and grooms and declining to a minimum in the oldest group. There were 2,838 brides and 2,515 grooms below the ages of consent. In 33 marriages the bride was 14 years of age and in 198 marriages, 15 years of age. There were 11 grooms 16 years of age and 84 grooms 17 years old. Most of these young brides and grooms were native born white; of the 33 brides who were 14 years old, 30 were native born white, 1 a native of Canada, and 2 negroes. Of the 198 brides 15 years of age, 178 were native born white, 5 natives of Canada, 5 of Italy, and 10 negroes. Of the 11 grooms who were 16 years of age all were native born white. Of the 84 grooms who were 17 years of age, 79 were native born white, 2 natives of Canada, and 3 negroes. At the farther end of the life span, there were 15 marriages in which the grooms were over 80 years of age; 14 native born white and 1 a native of Germany; the oldest brides were between 75 and 80 years of age. Of these, 12 were native born white, 1 a native of Germany, and 1 of Poland.—*New York State Weekly Health News*, 8: 65-66 (Apr. 27), 1931.

Tuberculosis in India—Tuberculosis has been a most prevalent disease in most Indian cities from ancient times, but there is evidence that it has rapidly increased within recent years, e.g., there has been an increase of 70 per cent in mortality from tuberculosis within the last 10 years in the city of Calcutta. The course of the disease seems to be more acute than in western countries. To understand the epidemiology of tuberculosis in India, it must be remembered that 90 per cent of India's popu-

lation still reside in the villages, and that urbanization, modern industrialism and the introduction of rapid transit facilities have been powerful factors in the diffusion of population during the last 50 years. Certain habits, such as spitting inside habitations, eating and drinking from common vessels, and sleeping together in the same room, are extremely common among all classes of society and favor massive infection. The malnutrition factor appears noteworthy, for the diet of the people in most parts of India has become unbalanced and inadequate within the same period. Another fact of great importance is that infection with the bovine type of tubercle bacillus is practically nonexistent in India. Only 2 or 3 per cent of cattle slaughtered in the slaughter houses show localized tubercular lesions.

Five years' mortality figures in the city of Calcutta show a very low death rate in the earlier years, reaching only 4 per cent by the 15th year. The curve rises rapidly from this age and attains its highest point at 30 years, falling down rather more slowly and reaching about 7 per cent by the 60th year. The initial peak of mortality which comprises nearly 15 per cent of the total deaths from tuberculosis in England and Wales and in most European countries is thus lacking. The Health Officer's report in Calcutta states that 94 per cent of the deaths are from pulmonary tuberculosis. The extremely low incidence among infants and children below 10 years of age is noteworthy. The incidence, however, rises high in the presence of a constant source of infection, e.g., according to a survey of 100 houses containing "open" pulmonary cases, 71.4 per cent of children between 1 and 5 years, and 83.3 per cent of children between 6 and 10 years were found to give positive reactions when they lived in the same room with such a case. What, however, is puzzling to authorities is the low figure of mor-

talidity at this age in the presence of a low degree of positive cuti-reactions.

In a series of 52,550 cases attending the Polyclinic of the Calcutta hospitals, the following incidence of tuberculous disease was found: Total number of tuberculosis cases, 1,019, of which the lungs were found affected in 62.8 per cent; glands in 17 per cent; bones and joints, 13.9 per cent; while skin tuberculosis accounted for only 2 in the series. Lung tuberculosis was found to be extremely rare below 10 years. All the forms of tuberculosis attained their maximum incidence between 25 and 30 years, 5 to 10 years earlier than those found in Europe. The duration of life of a case of pulmonary tuberculosis, which depends on the infecting dose, the age, the extent and multiplicity of lesions, the secondary bacterial flora in "open" cases and on the immunity of the individual, is distinctly shorter in India than in Europe. Further, it is shorter in females than in males. Pregnancy and lactation, diabetes, influenza, and kala-azar have been found to shorten the course. The lesions seldom remain localized, rapidly spreading to other parts of the lungs. Massive infection is the rule in a majority of cases.—A. C. Ukil, A Note on the Epidemiology and Pathology of Tuberculosis in India, *Tubercle*, 12: 244-250 (Mar.), 1931.

Provisional Mortality Report for Wisconsin, 1930—For the year 1930, Wisconsin, according to provisional reports, showed 30,261 deaths exclusive of stillbirths, this figure bringing the death rate per 1,000 population down to 10.3, as compared with 10.8 in 1929, 11.0 in 1928 and 10.4 in 1927. The death rate from tuberculosis for 1930 will undoubtedly be the lowest rate from this disease ever recorded in the history of the state. With a total of 1,490 deaths reported for 1930, the death rate was only 50.7 per 100,000 as compared

with a rate of 59.0 in 1928 and 55.2 in 1929. In 1929, with the lowest death rate ever recorded for diphtheria in Wisconsin, there were 79 deaths from this disease and in 1930 there were only 72 deaths reported, bringing the death rate down to 2.4 as against 2.7 and 3.5 for 1929 and 1928 respectively. There were no serious outbreaks of influenza in Wisconsin during 1930, and as a result only 470 deaths from influenza were reported as compared with 1,251 in 1929, reducing the high 1929 death rate of 42.1 to 15.9 in 1930. With the marked decline in the number of cases and deaths from influenza there was a considerable decline in the number of deaths from pneumonia, with a death rate of 72.6 in 1930 as against 77.2 in 1929.

There was practically no increase in the number of deaths from cancer during the past 3 years, the death rate for 1930 being 112.5. The reports for 1930 show a slight decline in the death rate from puerperal causes, 4.8 in 1930 as compared with 4.9 in 1929 and 5.8 in 1928. Epidemic meningitis deaths declined to about one-half, reducing the 1929 death rate of 3.9 from this disease to 2.0 in 1930. As contrasted with these declines in death rates, there was a marked increase in the number of suicides from 451 or a rate of 15.5 in 1929 to 546 or a rate of 18.9 in 1930. The death rate from automobile accidents also increased from 24.1 in 1929 to 26.9 in 1930. Measles and smallpox showed increases for 1930.

With 55,784 births reported for 1930 and 3,134 deaths reported among children under 1 year of age, the provisional infant mortality rate based upon the number of deaths among children under 1 year of age per 1,000 live births reported was 56.2. This is the lowest infant mortality rate ever recorded, in Wisconsin, and with the several hundred delayed 1930 birth reports which remain to be put on record, it is believed

that the final figures for infant mortality will be even slightly below 56.2.—*Bd. of Health Bull.*, State of Wisconsin, 5: 21-26 (Jan.-Mar.), 1931.

Suicides in New York State Reach New Maximum in 1930—Suicides in 1930 in the entire State of New York numbered 2,345, the greatest total ever recorded. The suicide rate, 18.6 per 100,000 population, was 22 per cent above the average rate for the preceding 5 years. Compared with 1929 the number of suicides increased in the entire state by 210, in New York City by 148, and in the rest of the state by 62. The increase in suicides in the state occurred mainly among men, the number rising from 1,563 in 1929 to 1,760 in 1930; among women, the increase was but slight—from 574 to 585. In the period 1920-1930 the number of suicides doubled from 1,189 to 2,345 while the population of the state increased by only 21 per cent. Suicides of men rose from 853 to 1,760—an increase of 106 per cent; suicides of women rose from 336 to 585, or 74 per cent.

The proportion of suicides to deaths from all causes in 1930 increased with age from a low point under 20 years to a maximum at 30-39 years, gradually declining to another low figure in the oldest group. In the age group 10-19 years, 12 out of 1,000 deaths were suicides; the ratio was 38 in 1,000 death at 20-29 years, rising to 41 at 30-39 years. The absolute minimum proportion—2 in 1,000 deaths—was recorded in the oldest group, 80 years and over. In New York City the number of suicides in relation to deaths from all causes was greatest between 30 and 40 years—46 in 1,000 deaths; upstate, between 20 and 30 years—35. There were 30 suicides of young persons under 20 years of age in New York City and 18 upstate. All but 1 of the suicides upstate were native born—the youngest, a boy 9 years of age. There were in

New York City 6 suicides of men and 2 of women over 80 years of age; upstate, 22 and 2. Three times as many men as women took their own lives. In the oldest age group, 80 years and over, there were 7 suicides of men to 1 woman. The next highest ratio, 4:1, was between 50 and 70 years. In the youngest ages the disparity was considerably less, suicides among men being only one and one-half times the number among women. Practically two-thirds of the men were between the ages of 30 and 60; the corresponding proportion of suicides among women fell between the ages of 20 and 50.

In about one-third of the suicides, poisonous gas (mainly illuminating gas and carbon monoxide) was the means employed; hanging, in 21 per cent; firearms, 15 per cent; jumping from high places, 10 per cent; and corrosive substances (bichloride of mercury, carbolic acid), 10 per cent. Poisonous gas was the leading means of suicide at all ages to the 70th year; in the older ages, hanging. Next in order of numerical importance were: under 20 years of age, corrosive substances; between 20 and 40

years, firearms; between 40 and 70 years, hanging; after the 70th year, poisonous gas. Among men, the most prevalent methods were: poisonous gas—30 per cent, hanging—24 per cent, firearms—19 per cent; among women, poisonous gas—39 per cent, corrosive substances—17 per cent, jumping from high places—15 per cent. There was considerable divergence in the means of suicide in New York City and in the urban and rural parts of the rest of the state. In New York City: poisonous gas—44 per cent, hanging—15 per cent, jumping from high places—15 per cent; in the urban upstate territory: hanging—26 per cent, firearms—21 per cent, poisonous gas—20 per cent; in rural New York: firearms—30 per cent, hanging—30 per cent, drowning—13 per cent.

There were 29 suicides in state institutions, located outside of New York City; 19 in state hospitals, 7 in state prisons, and 1 each in Craig Colony at Sonyea, Syracuse State School, and the Institution for Defective Delinquents at Napanoch.—*New York State Weekly Health News*, 8: 77-78 (May 18), 1931.

PUBLIC HEALTH ENGINEERING

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THE MILK CONTROL PROGRAM IN TEXAS *

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IN this discussion it will be my purpose to point briefly to some of the accomplishments of the standard milk ordinance program in Texas rather than to attempt to do full justice to all of the progress that has been made. For public health reasons alone the program was adopted by the State Department of Health in 1924, and its promotion since that time has been to provide cities with a means of producing clean safe milk at the lowest possible cost to the dairyman and the consumer.

In introducing the standard milk program in Texas our health officials realized that they were dealing with one of the world's largest industries, and one that affects vitally the future prosperity of the state as well as the health of her inhabitants. Consequently, they knew that the enactment of any law or the enforcement of any legislation which would hinder the industry would be undesirable. Regulations to govern the production of milk should at the same time encourage its wider use. A workable ordinance was therefore one that was fair, impartial, and economical. It was found that the standard milk ordinance was designed with that in mind.

While the standard milk ordinance is local in its application, the State Department of Health was charged with

coördinating and unifying the program for the state as a whole—a program that was in the course of 5 years to envelope the entire state. With the passage of the ordinance first by a little east Texas town late in 1924, an old industry was reborn. It was there that dairymen demonstrated the principles of milk sanitation as laid down in the standard milk control code, producing a milk superior in quality and one that could be transported, retained, or consumed at leisure. Milk sanitation there made possible the long haul, providing a market for fluid milk which had heretofore been a perishable product. New possibilities in the field of dairy husbandry were opened. Through standardization a definite milk program was established, and the confidence of the milk drinking public was insured.

Today Texas has some 96 towns operating under the standard milk ordinance. Some of these towns have made enviable records in milk sanitation, and others have done little. Failure may be attributed chiefly to lack of funds to carry on the work, politics, and incompetent inspectors. Notwithstanding these disturbing factors, the program has gone far toward promoting a wholesome respect for clean milk production, and its ever growing popularity speaks for its simplicity and efficiency in operation.

The program is not one of big buildings and much money. Fine barns and expensive equipment are not the prime

* Read at a Joint Session of the Public Health Engineering and the Food, Drugs and Nutrition Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 29, 1930.

requisites of clean milk production. Such outward camouflaging often cloaks bad methods of operation, and the real fundamentals of milk sanitation may be lost to the inspector in a mass of elaborate construction. Those factors that contribute most to the production of clean milk are simple, and, as outlined by the standard milk ordinance, are within the reach of every dairyman.

The standard milk ordinance is the result of years of study. It is the cream of some 400 nondescript milk ordinances from over a wide geographical area. Of the 25 items listed on the grade sheet not one could be omitted without jeopardizing some phase of clean milk production. A glance at the grade sheet shows the first objective to be dairy herds free of tuberculosis and dairy employees free of communicable disease. No one could dispute the importance of such measures for health protection, especially since bovine tuberculosis contributes 25 per cent of the tuberculosis of the human family. When we add to that the economic losses to the dairy industry due to the ravages of this most dreaded disease, we have some idea of the enormity of the hazard. Texas is fortunate in that it has a relatively small percentage of infected cattle. While other states are spending millions of dollars for the eradication of tuberculosis among cattle, Texas, through the standard milk program and the work of the Livestock Sanitary Commission, has cleaned up thousands of dairy herds, reducing the hazards of tuberculosis without the

alarming influence of state legislation.

Because of the standard milk ordinance thousands of dairy barns have been built—barns that are a source of pride to their owners—which provide shelter for thousands of dairy cattle. The standard ordinance has also built a correspondingly large number of milk houses that are symbols of cleanliness and an inspiration for the dairy industry. Sanitation has been introduced on the farm, many health hazards being reduced or eliminated thereby. The incidence of typhoid fever has been reduced by the construction of proper toilets and the systematic analysis of many water supplies.

Through its frank support of complete pasteurization, the standard ordinance has unconsciously thrown a protective barrier around the production of raw milk. The ordinance has exemplified the importance of regular physical examinations for the dairy attendant, thereby aiding the individual in maintaining good health. The principles of the standard milk ordinance are now being taught in the schools, having been added to the courses in dairy husbandry at Texas A. & M. College, and among other schools of higher learning. New interest has been aroused in the production and distribution of the world's greatest food, and new dignity added to the labor that industry entails. Through the inspection service provided by the standard milk ordinance, the health of our people is being safeguarded and the future of a great industry assured.

DISCUSSION

JAMES STEWART, M. D.

State Health Commissioner, Jefferson, Mo.

THE earliest efforts of the State Board of Health of Missouri toward the improvement of municipal

milk supplies was in 1923. Under the direction of the division of public health engineering, a cooperative pro-

gram with several cities was started, using an ordinance recommended by the State Board of Health. The program was inaugurated for the following reasons:

1. A high infant mortality rate
2. Requests from several unofficial civic organizations, such as commercial clubs, parent-teacher associations, etc., for information regarding the quality of their respective city milk supplies
3. Requests from city officials for assistance and advice relative to certain problems in milk sanitation
4. Information from various sources indicating unsatisfactory or no city milk ordinances in many instances and ineffective enforcement of existing ordinances in practically every city investigated

In brief, the program provided state aid to any city wishing to control milk sanitation. After an ordinance was passed and enforcement well started, the assistance of the State Board of Health ceased.

After 2 years this work was not proving entirely successful for the following reasons:

1. No regular supervision by the State Board of Health
2. Defects in the sanitary features of the ordinance recommended
3. Difficulty in enforcing the ordinance
4. Lack of adequate state personnel

In 1925 the U. S. Public Health Service Standard Milk Ordinance program was adopted, since it offered solution to many previous difficulties, and because of the increasing evidence of the need of safer municipal milk supplies. For the last 2 years this program has received continuous supervision by the State Board of Health and the U. S. Public Health Service. To date the ordinance has been passed in 26 cities in Missouri, representing a total population of 324,500, whose milk supply is produced under standard ordinance requirements. The total population of all cities having

2,500 and over, exclusive of Kansas City and St. Louis, is, according to the 1920 census, 489,596. Thus, 66 per cent of the population of cities of 2,500 and over, exclusive of Kansas City and St. Louis, are living in Standard Milk Ordinance cities. Surveys and some preliminary work toward the inauguration of milk sanitation programs have been undertaken in 20 additional cities with a population of approximately 100,000.

In the majority of cities accepting the Standard Milk Ordinance program it has been necessary to train inspectors who had no previous milk sanitation experience, since this was the best arrangement that could be effected. We are convinced that the success of a milk sanitation program is directly proportionate to the training and ability of the local inspector, backed by adequate support from the city officials. It is certain that far better results have been possible with the untrained personnel, which has been available, through the system of state and federal supervision than could have been obtained without this supervision. Also, it has been shown that trained local enforcement personnel does better work under supervision, possibly due to moral support and aid or because of periodic check-ups.

Our experience in Missouri cities indicates that, before enforcement of the Standard Milk Ordinance, the weighted average retail raw milk sanitation rating was approximately 50, the weighted average raw milk to plant sanitation rating was 37, and the weighted average pasteurized milk rating was 44. After enforcement of the Standard Milk Ordinance for an average of less than 2 years, the weighted average rating for raw milk showed an improvement of 50 per cent, raw milk to plant showed an improvement of 89 per cent, and pasteurized milk showed an improvement of 68 per cent.

The first rating of these Standard

Milk Ordinance cities indicated that 13 per cent of the milk supply was pasteurized; the last rating indicated that this had increased to 30 per cent. The average increase in milk consumption has been approximately 18 per cent.

In conclusion I wish to say that we have been well pleased in every respect with the operation of the Standard Milk Ordinance program, and feel very grateful to the U. S. Public Health Service

for valuable assistance. We have found many difficulties in our path but none that was insurmountable. Probably the most vexing problem at the present time is assuring trained city dairy inspectors reasonable tenure of office. This is a difficulty of real importance wherever the city officials are elected every 2 years, and it has been customary to change inspectors when incumbent officials are defeated.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., PH. D., AND LEONARD GREENBURG, M. D., PH. D.

Death of Dr. George M. Kober---
The first Chairman of the Section on Industrial Hygiene of the American Public Health Association, George Martin Kober, M.D., died at his home in Washington, D. C., of heart disease, April 24, 1931. He was one of the four to present papers in a "Symposium on Industrial Hygiene" at the Jacksonville Meeting of the Association, December, 1914, at which time the Section on Industrial Hygiene was organized. Dr. Kober has been a member of the A. P. H. A. since 1896, and was made a Charter Fellow in 1922.

Dr. Kober was born at Alsfeld, Rhine Province, Germany, March 28, 1850, and came to the United States in 1866, graduating from Georgetown University School of Medicine in 1873. He joined the U. S. Army as acting assistant surgeon in 1874, and spent 20 years of his professional life with the military service, principally in the West during the Indian troubles.

Dr. Kober was greatly interested in Indian welfare and championed it to the end of his life. He also acquired considerable holdings in land in Modoc County, Calif., which was put to graz-

ing. At the same time, in Washington, he was made President of the Sanitary



GEORGE M. KOBER, M.D.

Improvement and Housing Companies, and was considered a housing expert. When he returned to Washington in 1890 he was made Professor of Hygiene at his Alma Mater and in 1901 became the Dean of the School of Medicine,

which position he held until 1928, when he was made Dean Emeritus and one of the regents of the university. He received the degree of LL.D. in 1906, and Litt.D. in 1923, from Georgetown University.

Just after the beginning of the century he became interested in industrial hygiene through his work in the housing of workers, and in 1902 his student, Dr. C. L. F. Doerhing, made the first survey in America of what, in our modern conception, would be called "industrial hygiene" (*U. S. Labor Bulletin*, No. 44, 1903). This work was done under that venerable Commissioner of the Department of Labor, the Hon. Carroll D. Wright.

Dr. Kober was Chairman of the Industrial Hygiene Section of the International Tuberculosis Congress in 1906. In 1908, while Secretary of President Roosevelt's Homes Commission, he headed a survey of the government industries in Washington, an extensive report of which was published in *U. S. Labor Bulletin* No. 75, under the title, "A Report upon Industrial and Personal Hygiene."

He was very prominent as an organizer and official in professional and philanthropical societies and spread his interest in industrial hygiene through the various ones with which he was connected, such as the Association of American Medical Colleges, of which he was president in 1906, the Association of American Physicians, of which he was secretary from 1907 to 1916, the National Tuberculosis Association, of which he was president in 1915, the 15th International Congress on Hygiene and Demography, which met in Washington in 1912, the Pan-American Scientific Congress (also held in Washington) in 1916, and the medical and charitable organizations of Washington, in which he held practically all offices at some time in his life. He also had

many friends in Europe, particularly in Germany.

In 1916 he gathered a group of investigators and specialists in the field and with Dr. William C. Hanson as co-editor produced the well known volume, *Diseases of Occupation and Vocational Hygiene*. In 1920 he wrote a monograph, *Tuberculosis in Relation to Occupation*, and in 1924 was senior editor of Kober and Hayhurst's *Industrial Health*, which comprised the collaboration of 35 authors. He did practically all of his writing in long-hand and in a fine, closely written, although easily legible style.

According to his obituary in the *Journal of the American Medical Association*, he is said to have been the first to point out the agency of flies in the transmission of typhoid fever (in 1892). He established the Kober Foundation in Washington some 5 years ago. He turned the attention of his last years to his Reminiscences, which were published in two volumes only last year.

For the first few years after the formation of our Section on Industrial Hygiene he continued active in it, only ceasing when sickness in his near kinsfolk (he was a bachelor) and the conservation of his own health compelled him to restrict his activities and remain in Washington, where, however, many will remember him as a genial and kindly counsellor, usually to be found at the Cosmos Club. E. R. H.

A Guide-Book for Safety Education—This 89-page bulletin in paper covers has a foreword by William John Cooper, U. S. Commissioner of Education, in which he stresses the importance of teaching safety in the schools and finding room for the subject, thus:

The proper remedy for an overcrowded curriculum is a continuing survey with prompt exclusion from the course of study of obsolete materials and of everything which may be

learned when needed in other ways or at other times and the inclusion in their stead of materials which must be mastered at a comparatively early age unless pupils are to risk loss of life or suffer the loss of bodily powers which may handicap them throughout life.

The book has been very carefully compiled and intergraded for the primary and intermediate grades and secondary schools. The last portion handles the accident question in two columns, the one entitled "Objectives," and the other "Materials and Activities" for the prevention of automobile accidents, fire, railroad, water transportation, home, electrical, gas, aviation, school, industrial and forest relations. There are similar columns for first aid, and for vocational schools, with a final chapter on extra-curricular activities. There is a selected bibliography including sources of certain free materials, slides and films, but no index or table of contents. The introduction is by Albert W. Whitney, Vice-President in Charge of Education, National Safety Council.—National Bureau of Casualty and Surety Underwriters, New York, N. Y., 1931.

E. R. H.

The Effect of Variations in Relative Humidity upon Skin Temperature and Sense of Comfort—From the Conclusions: The effect of relative humidity upon the sense of warmth is in accordance with the effective temperature concept for dry bulb temperatures between 60° to 80° F. The magnitude of the effect obtained on the average for the four subjects and the investigator was somewhat less than would have been expected from Yaglou's thermometric chart. A difference of 50 per cent relative humidity corresponded, in its effect upon the sense of warmth, with a difference of 1.7° F. in dry bulb temperature at 61–62° F. at a constant relative humidity, and with a difference of 4.0° F. at 70° F. The rates calculated from Yaglou's thermometric chart are 2.5° F.

at 61° F., and 4.6° F. at 70° F. on the average for different humidities.

Relative humidities of 70 per cent and above cause an uncomfortable feeling of wetness at 70° F.—Unichi Miura, *Am. J. Hyg.*, 13, 2: 432–459 (Mar.), 1931.

E. R. H.

The Behavior of Lead in the Animal Organism, II. Tetraethyl Lead—Summary and conclusions:

1. These experiments show that tetraethyl lead is absorbed through the skin.

2. The initial distribution of the lead in the tissues in rapid tetraethyl lead absorption corresponds to that of an oil-soluble material, and indicates therefore that some portion of the tetraethyl lead is absorbed and circulates as such.

3. However, tetraethyl lead is rapidly decomposed by the tissues, including the skin, so that only a small portion of the lead found later in the blood is in the form of tetraethyl lead.

4. As a net result, after a period of from 3 to 14 days, all of the lead in the animal tissues is distributed in a manner characteristic of water-soluble lead compounds.

5. In small dosages the factors of rapid decomposition and low concentration in the blood so interfere with the distribution of tetraethyl lead as such, as to prevent its primary absorption by the nervous system.

6. Even when absorbed as the tetraethyl compound, the excretion follows quantitatively that of water-soluble lead compounds.

7. Tetraethyl lead poisoning is therefore not different from lead poisoning occasioned by other lead compounds.

8. Evidence is adduced showing that tetraethyl lead absorption from gasoline in concentrations not in excess of 0.1 per cent is inappreciable.

—Robert A. Kehoe and Frederick Thammann, *Am. J. Hyg.*, 13, 2: 478–498 (Mar.), 1931.

E. R. H.

Treatment of Tetanus, Report of Two Cases—Regarding antitetanus serum there is an unanimity of opinion as to its effectiveness as a prophylactic, whereas some element of doubt has been expressed as to its therapeutic value in certain cases in which the disease is already established. This communication

embodies a report on the treatment of two cases of tetanus with massive doses of antitoxin given within a short interval after admission to hospital. The patients manifested the disease in its most severe form, with a very short incubation period in each case.

The first case was that of a boy, 9 years of age, admitted to the hospital on August 20, 1930, who had run a fish-hook into his thumb 10 days prior. On the 6th day, the symptoms developed with stiffness in the neck and locked jaw, becoming progressively worse until most marked symptoms were present on admission (described). The second case is that of a boy 10 years of age, admitted to the hospital, January 6, 1931, who had been injured in the face by a stick of wood which had produced a small punctured wound. The symptoms began 3 days after the injury, and were typical on the 6th day when admitted (described).

The method of treatment consisted of very large doses of tetanus antitoxin, 2,867,500 units in the first case, and approximately 800,000 units in the second case, given by a continuous intravenous method in which the antitoxin was introduced in a 5 per cent glucose-in-saline solution. It was noted that in spite of the large amounts of protein given intravenously, practically no protein was excreted by the kidney and no damage was occasioned by the tricresol contained in the antitoxin. Both cases recovered, without complications.

E. R. H.

Eyes Saved in Industry, the Experience of 583 Companies—This is *Publication No. 62*, a Joint Study by the National Safety Council and the National Society for the Prevention of

Blindness, 23 pages, illustrated, tables and appendix. Price 15 cents. (450 Seventh Avenue, New York, N. Y.)

E. R. H.

The Effect of Irradiation with Ultra-Violet Light on the Frequency of Attacks of Upper Respiratory Disease (Common Colds)—Summary:

1. A group of adult volunteers, numbering 363, was kept under observation from September 29, 1929, to May 31, 1930, a period of 35 weeks, and a vigorous effort was made to secure reports of all cases of upper respiratory disease (common colds).

2. From this number, approximately one-half were selected at random for irradiation, which was given over the first 31 weeks of the period. Mercury-vapor lamps were used and the intensity of erythema-producing rays was measured bi-weekly. The dosage was light to moderate, the individuals being stripped to the waist and exposed, either on chest or back on each occasion, to that dose which, from previous experience with the subject, seemed likely to produce only a minimal erythema.

3. Total incidence for the period was slightly higher for the irradiated (receiving more than 10 treatments) than for the controls. Also cases of a more severe type, as evidenced by absence from duty and confinement to bed, by occurrence of fever, by productive cough or by long duration, were just as frequent in the irradiated as in the control group.

—James A. Doull, Mary Hardy, Janet H. Clark, and Nathan B. Herman, *Am. J. Hyg.*, 13, 2: 460-477 (Mar.), 1931.

E. R. H.

Public Safety—This is a monthly publication for popular use by the National Safety Council, 20 North Wacker Drive, Chicago, Ill., illustrated, a few advertisements, averaging 35 pages.

E. R. H.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Observations on the Assay of the Antineuritic Vitamin—It has been shown that since rats will develop signs of polyneuritis with a small amount of the antineuritic vitamin in the diet it appears that the symptoms of polyneuritis in rats may indicate an insufficient amount of the vitamin rather than its complete absence.

In the experiment here reported diets of various composition were used with a view to ascertaining which were the most favorable for the production of polyneuritic symptoms in rats. A table is given showing the composition of the different diets and the number of rats showing polyneuritic symptoms.

Tests were also made in which six antineuritic concentrates were injected subcutaneously or intraperitoneally. The results show that as the dosage approaches the minimum curative amount some of the animals will be cured and others will not. In this experiment, some of the rats were cured after 5 or 6 previous attempts, and 1 rat was cured after the 11th attack.

Other investigators have succeeded in curing rats that had had more than 2 attacks and others have reported cures after the 6th attack. However, it would probably not be safe to test a preparation on a group of rats all of which have had more than 2 or 3 previous attacks.—W. H. Sebrell, E. Elvove, *Pub. Health Rep.*, 46: 917 (Apr. 17), 1931.

The Unsaponifiable Lipoids of Lettuce. I. Carotene—The purpose of this report is to record a few observations upon the properties of carotene and to present further proof of the vitamin A activity of this substance from lettuce. During an investigation of the

unsaponifiable lipoids of lettuce some brilliant, red, pleochroic crystals separated from a methyl alcohol solution. These crystals proved to be carotene. Approximately 200 mg. were isolated from 10 kilos of dried lettuce, representing 140 kilos of fresh leaves. Carotene crystallizes in the hexagonal system. Carotene solutions may be bleached by heat, ultra-violet light, and by the presence of autoxidizable fats. The physiological activity of carotene was determined by the curative method.

Rats whose diet had been devoid of vitamin A were used when growth had ceased and ophthalmia was usually marked. Carotene in doses of 0.005 mg. per day was always sufficient, except in abnormal cases, to cause a marked increase in weight and recovery from ophthalmia. Cases which failed to respond to carotene treatment always showed other abnormalities, urinary calculi being often present.

From the growth curves it is noted that most of the cases average 3 to 5 gm. gain per 0.005 mg. of carotene, the amount contained in the ordinary 1 drop dose. An explanation of the unusual physiological and chemical properties of carotene must await further information on the structure of the molecule and on the probable electronic alterations which it may undergo.—H. S. Olcovich and H. A. Mattill, *J. Biol. Chem.*, 91: 105 (Apr.), 1931.

The Antiscorbutic Potency of Apples. II—Previous experiments (*Biochem. J.*, 24: 82, 1930) have indicated that (1) Bramley's Seedling is much more potent in antiscorbutic activity than other varieties tested; (2) there is no indication that the age of the tree,

the soil or the season has any effect on the antiscorbutic activity of the apple; (3) there is little deterioration of the vitamin when apples are stored at 1° C. in the air (cold storage) or at 10° C. in an atmosphere of approximately 10 per cent oxygen, 10 per cent carbon dioxide and 80 per cent nitrogen (the loss being greater in the "gas" stored apples); and (4) heating Bramley's Seedlings in their skins at 115° C. for 50 minutes has little effect. The present paper deals with a continuation of these studies. The varieties tested for antiscorbutic activity were Newton Wonder and Lane's Prince Albert, the first being taken from 15-year old trees and the second from 15- to 20-year old trees. The apples were stored at a constant temperature of 1° C. and weekly tests were made. It was shown that:

1. Newton Wonder apples have a vitamin C content of the order of that of Cox's Orange Pippin, while Lane's Prince Albert falls between the Bramley's Seedling and the Cox's Orange Pippin.

2. Bramley's Seedling apples can be frozen at 20° and stored at this temperature for 4 months without losing appreciably in antiscorbutic activity.

3. Bramley's Seedling apples gathered at the end of July were not more active than the normal apple from the same plantation gathered in October.

4. Bramley's Seedling apples stored at 3° in air for 5 months do not lose any of their antiscorbutic activity.

5. The concentration of vitamin C in the tissue of the apple increases as the skin is approached from the core and is more than 6 times as great in the peel as in the flesh near the core.

—Mary Forrest Bracewell, Franklin Kidd, Cyril West and Sylvester Solomon Zilva.—*Biochem. J.*, 25: 138, 1931.

The Antiscorbutic Potency of Apples. III—In comparing the potency of different varieties of apples, a marked difference between the antiscorbutic activity of the Bramley's Seedling and the King Edward was observed in spite of

the fact that they resemble each other in so many respects. In this experiment an attempt was made to determine whether a relationship existed between the nitrogen content and the antiscorbutic activity of the apple. A table is given showing the tests as carried out. It was found that King Edwards containing about 0.0307 per cent of nitrogen were about 1.5 times as potent in vitamin C as apples of this variety containing about 0.0387 per cent of nitrogen. No significant difference in the vitamin C content was found between Bramley's Seedlings containing high and low quantities of nitrogen.—Mary Forrest Bracewell, Thomas Wallace and Sylvester Solomon Zilva, *Biochem. J.*, 25: 144, 1931.

The Effect of Acidity on Lactobacillus Acidophilus Cultures—From the results heretofore reported it was concluded that *L. acidophilus* milk cultures could be stored at either refrigerator or room temperatures for several days without any considerable destruction of the organisms provided the original acidity was not too high. The results given in this report were obtained upon milk cultures of *L. acidophilus* that were high in acidity when stored. A decrease in the number of organisms took place at an acidity of approximately 1.2 per cent in all but one strain. At higher acidities of approximately 1.5, 1.6, 1.7, and 1.8 per cent, a still greater destruction of organisms took place. The acidity at which this greater destruction occurred varied with the strain. It was indicated that the particular sample of each strain that gave the highest count before storage usually gave the highest count of the series after storage at 9° or 24° C. The results obtained indicated that the acidity at which the maximum number of organisms was secured during incubation of a culture was an index as to the acidity at which to place cultures in refrigerator storage. •

—Luther A. Black and J. C. Harris, *J. Dairy Sci.*, 14: 198 (May), 1931.

The Vitamin A Content of Oats—

This is a report of an investigation made of the vitamin A content of whole hull-less oats and of the acetone-extracted oil of the whole hull-less oats. Rats 28 to 30 days old and weighing 50 gm. were placed on a vitamin A free irradiated basal diet, supplemented with dried brewer's yeast to furnish vitamins B and G. Definite ophthalmia usually developed within 25 to 35 days, at which time ground whole hull-less oats as the sole source of vitamin A replaced the same percentage of starch or Crisco, or parts of both the starch and the Crisco in the diet. The test period was 8 weeks. It was found that whole hull-less oats are almost if not totally lacking in vitamin A, and death occurred when whole oats were fed at levels of from 0.6 to 5 gm. daily. When acetone-extracted oat oil was included in the diet, the condition of the animals was slightly improved. All but one animal lived throughout the 8-week period but growth was very slow or completely arrested.

From these results it is concluded that oat oil contains a small amount of vitamin A. When 8 drops of cod liver oil was given, ophthalmia was completely cured in 7 to 14 days, which indicated that the poor condition of the

animals was not due to a toxic effect of the supplement but to a deficiency of vitamin A in the oat oil.—Clara R. Meyer and Rossleene Arnold Hetler, *J. Agri. Res.*, 42: 501 (Apr. 15), 1931.

Utilization by Normal Adult Subjects of the Calcium and Phosphorus in Raw Milk and in Ice Cream—The subjects used in this experiment were 10 normal adults, 5 of whom were irradiated daily for a period of 5 minutes at a distance of 30 inches from the arc. The diet, which was somewhat acid-forming, as is common throughout this country, consisted of ground lean round of beef, white bread, polished white rice, raw apple, orange juice, prunes, and oleomargarine. The variables of the diet were ice cream and raw milk. It was found that for the non-irradiated subjects, the calcium of ice cream gave the more favorable balance, while for irradiated subjects, the calcium of fresh milk was slightly better. The non-irradiated subjects showed calcium balances at least as favorable as those of the irradiated subjects. The non-irradiated subjects also showed somewhat better phosphorus balances than the irradiated subjects, but practically no differences appeared between the milk and ice cream periods.—Martha M. Kramer, Myra T. Potter and Isabelle Gillum, *J. Nutrition*, 4: 105 (May), 1931.

CHILD HYGIENE

RICHARD A. BOLT, M. D., DR. P. H.

CHILDHOOD tuberculosis is commanding a great deal of attention at present. Almost every medical and public health journal of recent date contains one or more articles upon some phase of this subject. It is common knowledge that there has been a steady and consistent decline in mortality from tuberculosis during the past two or three decades. While this has been most marked in countries where intensive public health work directed against tuberculosis has been carried on, it is none the less true that a decline is noted also in other places where very little, if any, concerted effort is expended in controlling this disease.

In the United States a considerable decline in tuberculosis death rates has taken place at all age levels, being most marked in childhood, and among males between 20 and 45 years of age, and showing the least reduction in females between the ages of 15 and 20.

In 1923, Dublin¹ predicted that a tuberculosis death rate of 50 per 100,000 population would not be far from the actual figure in the year 1930. While the rate for the whole Death Registration Area has not yet reached that figure, it is tending toward that rate and in a number of individual places has actually reached it. What Dublin stated then is just as true today:

The tuberculosis movement must not rest on its laurels nor be allowed to drift along easy ways. The disease is on the decline. This is an opportune time to apply even greater energy along approved lines, that there may be no diminishing but rather cumulative returns in life saving.¹

During the period under consideration much research has been directed

along lines of childhood tuberculosis. The more recent investigations have altered considerably our conception of tuberculosis in children and its relation to adult tuberculosis. Our emphasis of the relative value of the various means of diagnosis has shifted and a new classification of the types of tuberculosis has replaced the old. The extensive use of the tuberculin test and more refined technic in the manipulation of the roentgen rays in the diagnosis of childhood tuberculosis have given us a more definite and clear-cut picture of the disease.

It has been noted for some time that the morbidity from tuberculosis and the mortality do not coincide. The results of tuberculin testing reveal varying percentages of positive reactions depending upon age, opportunities for infection, type of community, racial factors, etc. During school age the death rate from tuberculosis is relatively low while the infectivity as shown by tuberculin tests is high. Myers² in his new book, *Tuberculosis Among Children*, devotes a whole chapter to consideration of the incidence of tuberculosis in children. The chapter is summarized as follows:

1. Tuberculous infection in this country is by no means universal among children.

2. The incidence of infection among school children has been found to vary from 10 per cent to 90.2 per cent depending upon the opportunities for exposure to tubercle bacilli.

3. The tuberculosis of a community is reflected in its children.

4. Tuberculin tests applied to all children of a community is the best method of approaching the tuberculosis problem. Among the positive reactors will be found children with tuberculous disease, and among their adult associates will be found open cases of tuberculosis previously unrecognized.

Myers also points out clearly that tuberculosis is largely a family disease, and that its prevention in childhood must begin in the family group.

When tuberculosis exists in the family, the infant should be separated from the tuberculous member as soon after birth as possible. This should be accomplished before infection has occurred, but if the child has already been infected, the separation should be provided for at the earliest possible time. Contrary to a rather general belief the infant who reacts positively to the tuberculin test is in danger from further infection. Every physician should test rather frequently with tuberculin each infant under his care, and if possible make X-ray studies of the chests of the close associates.

Pasteurization of the milk is emphasized as well as avoidance of adult infection. Everyone interested in this recent work with childhood tuberculosis should read Myers's book from cover to cover. At the end of each chapter are references to original sources.

As an excellent companion to Myers's book one should have at hand the convenient brochure, *Childhood Type of Tuberculosis*, by Chadwick and McPhedran, published as diagnostic aids by the National Tuberculosis Association.⁷ The childhood and adult types of tuberculosis are clearly differentiated. The diagnosis depends upon the history, symptoms, physical signs, tuberculin test, X-ray evidence and the exclusion of other causes that might produce similar conditions. It is emphasized that the diagnosis of childhood tuberculosis cannot be based upon any one sign or symptom.

Many children have the childhood type of tuberculosis without manifesting any symptoms that can be ascribed to the disease, although they may have a progressive lesion. . . . The tendency to tire easily is often noted and may be said to be the most common symptom in these children.

These authors, as most of the modern workers in the field of childhood tuberculosis, lay most stress upon a care-

ful history, the tuberculin test and the roentgenogram.

According to these authorities,

A positive reaction to the tuberculin test always means infection with tubercle bacilli, but it does not necessarily indicate disease, or whether it is active or latent. The Mantoux or intracutaneous test is more accurate, and with it a slightly larger number of reactors will be obtained than is possible with the Pirquet technic.

Referring to the value of the X-ray it is stated:

A roentgenogram is indispensable in the examination of a child's chest. Without it a positive diagnosis of the childhood type of tuberculosis cannot be made. Furthermore, a physician, however good a clinician he may be, is not justified in excluding tuberculosis without checking his physical examination of the chest with the evidence that only an X-ray film can give.

Chadwick has shown also that weight as an index of tuberculosis is fallacious. In either the childhood or the adult types of the disease we may find underweight, average weight or overweight children. If we take only the underweight children many cases of childhood tuberculosis will be missed.

Tuberculosis is particularly insidious in young women from 15 to 20 years of age. At this period any undue strain may cause a childhood type of tuberculosis to take on the characteristics of the adult type. A number of recent studies have been made which show that the adolescent years are especially dangerous, and should therefore be protected against any severe stresses or strains.

A survey of tuberculosis in certain schools in Colorado⁸ brings out some very interesting points:

1. The statistics for the mortality and morbidity of tuberculosis in children today and 10 years ago are not comparable.
2. The number and size of positive reactions increase in children commensurate with contact and the age as noted by Dickey.
3. The incidence of tuberculous infection among children varies greatly in different parts

of the country and is influenced by climatic and other environmental factors.

4. A survey for tuberculosis in the school of a good community composed largely of health seekers, when contact with the disease is unusually great, showed 36.4 per cent of 283 children from 4 to 15 years of age to be infected. This is only a moderate increase over the incidence noted in non-tuberculous communities.

5. Roentgen studies of the 103 children giving positive reactions revealed childhood tuberculosis in 19 or 6.7 per cent of the whole group. An average for the country at large varied from 1 to 4 per cent.

6. No child with the adult exudative type of tuberculosis was found.

7. Most of the children reacting positively and those having active childhood tuberculosis were not born in Colorado.

8. Climatic factors in Colorado apparently exert a favorable influence in the protection of children against active tuberculous infection.

9. In this study the father was the source of infection in 64.8 per cent of the children giving positive reactions and mothers in only 12.6 per cent.

10. Symptoms of fatigue, undernourishment and a history of frequent colds are not reliable aids in the diagnosis of childhood tuberculosis.

The practical conclusion to all this discussion is that every community should make ample provisions for the tuberculin testing of its childhood population and for the proper follow-up with X-ray examinations.

REFERENCES

1. Dublin, Louis I. The Causes for the Recent Decline in Tuberculosis and the Outlook for the Future. *Trans. 19th Annual Meeting of the National Tuberculosis Association*, Santa Barbara, Calif., June 20, 1923.
2. Myers, J. Arthur. *Tuberculosis Among Children*, 1930, p. 75.
3. Chadwick, Henry D., and McPhedran, F. Maurice. *Childhood Type of Tuberculosis*. Natl. Tuberculosis Assn., 1930.
4. Forbes, Roy P., Verploeg, Ralph, and Bazemore, M. K. A Survey of Tuberculosis in Schools in Colorado. *Am. J. Dis. Child.*, 41, 1: 26-31 (Jan.), 1931.

Sex Education in Childhood

THE May issue of *Child Study* is given over entirely to the consideration of sex education in childhood. It contains a number of informative articles on various aspects of sex in childhood by such well-known authorities as Marion Kenworthy, Leonard Blumgart, Mrs. Cecile Pilpel, Floyd Dell and Dr. Charles W. Margold. In the editorial introduction Marion Kenworthy aptly states:

Sex education of an ideal sort can only be accomplished through a consistent constructive handling of the parent-child relationships. . . . The most effective way to spread this important educational movement is through active work with parents; for the emotionally balanced child of today is the mature parent of tomorrow.

The Parents' Rôle in Sex Education is clearly presented by Dr. Blumgart. Among other important points in his well balanced article he states:

Just as children use their parents as models in all other spheres, so also are they models in their sex life, though perhaps in a more subtle but no less significant way. It is, therefore, most important that parents should understand the growth and development of the sex drives in human beings.

There is also in this interesting issue a brief discussion by Dr. Bernard Glueck of Sigmund Freud's criticism of society.

There appear the usual parents' questions and discussions, book reviews, and news items.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

How Much Nurses Knew about Obstetric Nursing in 1930 as Revealed by a Survey Made by the Subcommittee on Obstetric Teaching and Education of Nurses and Nursing Attendants of the White House Conference on Child Health and Protection—Graduates of hospital nursing schools are doing obstetric nursing in hospitals as "special," "head," or "staff" nurses, and in homes as "private duty," "hourly," "visiting," or "maternity and infant hygiene" nurses.

What Nurses in these Positions Are Being Asked and Expected to Know How to Do:

1. Find pregnant mothers and teach them their need for medical care during pregnancy and persuade them to go to a doctor
2. Give instruction to fathers and mothers individually and in class groups about
 - (a) The mother's hygiene during pregnancy and how it may be fitted into the daily régime of the home
 - (b) Preparation for the baby, including his bed, his toilet supplies and the care of them
 - (c) Preparation of delivery supplies and a plan for the mother's care during delivery and the lying-in period
 - (d) Care of the baby, including his bath, his rest, his exercise, his food and his daily régime in relation to the needs of the family
3. Observe and question the mother to learn about symptoms and discomforts needing attention—including simple urinalysis and measuring the systolic blood pressure
4. Study the mother's home surroundings and family relationships so as to discover—and help to solve—any problem which in any way may disturb her peace of mind
5. Consider the health of every member of the family—teaching the fundamentals of per-

sonal and home hygiene and arranging for health examinations, the correction of defects, the following of treatments or advice

6. Help the doctor or midwife during labor and delivery

7. Give—or teach some responsible person to give—the necessary care to mother and baby during the days that follow

8. Teach the family why a well baby needs continuous medical supervision and why a mother needs an examination by a doctor after the baby is 6 weeks old, and help to arrange for them and for further care when that is indicated

9. Keep the doctor of hospital informed by sending a detailed report of each visit including findings and advice

How the Nurses Questioned Were Chosen:

There were three groups of them:

1. Private duty nurses registered in 1930 for obstetric nursing in the 93 Nurses' Official Registries—each registrar was asked to send the names of 10 nurses to whom the questions could be submitted.

2. Nurses graduating from schools of nursing in 1930 and taking the state board examinations in the summer months. Each board of examiners was asked to present the questions to its applicants, with the request that they be answered, not for credit, but as a contribution to the work of President Hoover's Conference.

3. Nurses taking postgraduate courses in public health nursing in 9 universities in 9 states, and writing examinations in the summer of 1930. The directors of the courses presented the questions as supplementary to their examinations in much the same way as the state boards of examiners did to the second group.

These Were the Two Questions Asked:

1. State what you consider constitutes complete care for a mother from the beginning of pregnancy until the baby is 6 weeks old (29 items in the detail of that care were listed for the nurses to check).

2. How can maternal mortality be prevented?

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

Conclusions from the Returns:

Sixteen hundred and twenty-two nurses returned their answers to these two questions. Only 17.9 per cent mentioned a physical examination and continuous medical supervision during pregnancy as an essential element in adequate maternity care; 24.9 per cent mentioned an aseptic delivery; 8.7 per cent postpartum medical care; and only 5 per cent postpartum nursing, to give only a few of the figures. It was clear that the nurses did not know what adequate maternity care is.

A large number of nurses did not even answer the question about preventing maternal mortality. Some answered it in a way to indicate they had no idea what maternal mortality meant.

And so we must conclude that, with few exceptions, nurses do not know that many of the deaths of mothers in childbirth can be prevented, that obstetric nursing plays a part in that prevention or that the great number of those deaths in this country is a national problem that challenges every doctor, nurse, and health worker who comes in contact with pregnant mothers.

Where the Public Health Nursing Group Stood:

The best answers to the questions came from the students in a postgraduate course in public health nursing who had recently attended an institute in obstetric nursing.

CONCLUSION

This hasty study has shown that the teaching of obstetric nursing has been inadequate. Just how this situation can be improved will have to be worked out by a committee especially interested in maternity care and

... qualified to develop methods for and to stimulate the adoption of better teaching of obstetric nursing. Such a committee would need funds and a full-time secretary who should be a nurse who knows obstetric nursing. Such a committee should work closely with the National League of Nursing Education and the Committee on the Grading of Nursing Schools to avoid duplication of effort.

It will be some time before the work of such a committee can be finished. In the meantime those improvements that can be stimulated by an appeal from the White House Conference to all hospital trustees, medical boards, superintendents, directors of nursing, boards of nurse examiners and nurses' associations should be encouraged.—

Next month we will give a summary of the recommendations of this committee. —The White House Conference on Child Health and Protection. Excerpts from the Report of the Subcommittee on Obstetric Teaching and Education of Nurses and Nursing Attendants, *Am. J. Nurs.*, XXXI, 5: 581-585 (May), 1931.

This Official Health Agency Has a Completely Generalized Program—Memphis, Tenn., is unique in that the Health Department nursing staff, numbering 40, carries on an almost completely generalized public health nursing service. Two nurses do delivery service and another nurses the major communicable diseases in the homes. The program of the nursing service includes bedside nursing care as pay, part-pay and free service, school nursing, child hygiene, preschool, prenatal and postnatal care, tuberculosis and communicable disease nursing. It is paid for entirely by taxation. The fees collected for nursing care and delivery service go into the city treasury and do not alter the budget of the Division of Public Health Nursing.

Health Department nurses lend assistance to private physicians at deliveries where a fee of \$5 is paid for the first 4 hours and \$1 for each succeeding hour. These nurses also assist with all cases delivered by the out-patient department of the City Hospital. The two delivery nurses and another nurse from the Health Department assist with the prenatal clinics of the out-patient department of the City Hospital which are under the department of obstetrics in coöperation with the University of Tennessee.

All calls for the delivery nurses of the Health Department are handled by the City Hospital telephone exchange operator. The bag equipment for private as well as out-patient cases is furnished by the maternity department of the City Hospital. All cases are referred to the Health Department nursing staff for prenatal and postnatal care.

This generalized nursing program, completely tax supported, grew out of a survey of the city's health and hospital facilities made in 1924. A second appraisal of the health and hospital facilities was made in 1930. The following is a quotation from the report of the last survey:

Since January 1, 1926, the number of cases delivered by the Out-Patient Department has shown a 100 per cent increase, but the most marked increase has been among cases for private physicians which at the end of 1929 increased to a number five times as large as the number delivered in 1926. The average number of deliveries per month for 1929 was about 25 for private physicians and about 50 for the Out-Patient Department. The large number of births occurring in hospitals in Memphis reduces proportionately the responsibility of the Health Department for a home delivery service; in 1929, 55 per cent of the total births occurring in hospitals, 67 per cent of the white and 38 per cent of the colored (84 per cent of all colored births were registered at the Out-Patient Department prenatal clinics).

The Memphis Health Department Division of Public Health Nursing now feels that the main objective of their maternity program should be to find prenatal cases earlier in pregnancy, get them under competent medical supervision earlier and increase the number of visits per case.—Bride L. Cawthon,

Delivery Service in an Official Public Health Agency, *Pub. Health Nurse*, XXIII, 5: 235, 236 (May), 1931.

Miss Gardner Wins the Saunders Medal—At a meeting of the Advisory Council of the American Nurses' Association in Atlanta, Ga., May 4, it was announced that the Walter Burns Saunders Medal Committee had been unanimous in its selection of Mary Sewall Gardner of Providence, R. I., as the recipient of the medal for distinguished service to her profession.

Miss Gardner is probably best known to the rank and file of public health nurses through her book *Public Health Nursing* which has been translated into several languages and which is known as the standard textbook in public health nursing throughout the civilized world. It was not this book of Miss Gardner's which influenced the Medal Committee, however, as writing was the only service excluded in determining who should receive the award. Miss Gardner for the past 20 years has been closely identified in her professional career with the dramatic development of public health nursing. Her colleagues call her the "dean of public health nursing."

The Saunders Medal Committee announces that application for the 1932 Saunders award may be submitted at any time during the coming months. Rules for eligibility were given in the Public Health Nursing Section in the April, 1930, *American Journal of Public Health*.—June *Bulletin* of the American Nurses' Association, 1931.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Next Is Montreal!—For those concerned with any phase of public health education Montreal is the next source of ideas and information.

The Public Health Education Section members' dinner Monday night will take up several questions of vital interest touching health education progress.

Radio, amateur movies and exhibits will have a session.

A half day will be given to high school health instruction.

Canadian health workers will entertain and instruct at a luncheon.

And one luncheon session will undertake to answer all of the unanswered questions!

What question would you like to have answered?

What question would you like to answer?

Please tell the editor of this department.

Racine Listens In—Most figures as to the number of radio listeners are guesses, but Racine tried for facts.

In the week of May 11 to 16, Health Department nurses were instructed to inquire at each home where they made a call, whether or not the family was in the habit of listening to the Health Department radio programs, inaugurated April 1, 1931. These calls were not made for the purpose of checking up on radio, but were the regular calls made by nurses for other purposes. They represent all parts of the city and all educational and economic levels without selection.

The question asked was simply whether the family was in the habit of listening to this program. They were not asked how they liked it, because we felt that many of them

would be disposed to be courteous and to say that they liked it, even if they did not. The figures follow:

No. of homes at which nurses called	564
Homes without radio	133 (23.6%)
Homes with radio	431 (76.4%)
Homes in the habit of listening to Health Department program	186 (33.0%)
Homes not in the habit of listening to Health Department program	245 (67.0%)

If we apply these percentages to the entire city, we get the following figures:

Total number of homes	14,000
Number without radio	3,140
Number with radio	10,860
Homes with radio not getting our program	6,180
Homes with radio and getting our program	4,680

Discounting this last figure 50 per cent as a margin of safety we feel safe in estimating between 2,000 and 2,500 homes getting our message.

Of course, the latter part of this letter goes deeply into the realm of speculation but it is interesting and I know of no other way to estimate a radio audience. At least we are satisfied that our effort is worthwhile.

—W. W. Bauer, M.D., Commissioner of Health.

International Hygiene Exposition—Happily Dresden will continue its great health show through the summer of 1931. Further information may be secured through Dr. Rudolph Woerner, Room 835, 1775 Broadway, New York.

Readers of this department who visit Dresden may secure capable guide-interpreters at low cost. The editor will be glad to supply letters of introduction to staff members of the German Hygiene Museum, which is the central and permanent feature of the Exposition.

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

Will They Do It?—What about the men or the women or the youngsters whom you expect to read your printing—will they do it?

Yes, if you compel them to. The only way in which you can compel them is through the first impression they form the minute they receive your printed matter . . . call it attention-value, or what you will, you willingly admit that first impressions come through appearance. . . . Appeal to the eye in any form of sales promotion, is always a matter of printing, for modern printing is a great deal more than type, paper, and ink. . . . It is design, colors, size, style, the right type, and the right paper. It is possessing sound knowledge of how to print so it will be read and applying that knowledge to production. . . . Will they do it?

—From house organ of Speaker-Hines Printing Co., Detroit.

A Mother's Library—Do department stores in your city distribute or loan publications on the care of infants? This idea is fostered by *Infants' and Children's Department* (1 E. 35th St., New York), which says (May, 1931):

A reference library for mothers is a tremendous potential factor in the building of business in infants' departments. The early departments for the most part felt that the loaning of books to mothers was an essential part of education. They found that it helped the department materially. They knew that infant welfare is largely a matter of education; and that the store which does the best job of educating stands the best chance of getting the business. Today, the idea of service is not so much emphasized. Certain outstanding books for mothers on motherhood and babyhood are available to stores for loaning purposes. Lending these books to mothers, without charge, tends to build in a mother's mind the belief that the store has her welfare at heart. The outlay for the books is small; the good accomplished by the loaning is great. . . . Lending a book is indeed a small gesture, but one that mothers accept gratefully. Most of them do not know what to ask for or where to look for it, even if they desire to have all possible information on subjects which so vitally concern them.

This points to another example of the

many worthwhile jobs which usually cannot be touched for lack of time. *But it is a job for volunteers.* The out of date or definitely undesirable may now be used in some stores. Other stores might become interested in the idea and have a welcome for suggestions. Sales people in specialty and department stores having infants' and children's departments hear much about the problems of mothers. It is important that they know good publications to mention, and have good material to distribute when they undertake this service.

A tactful committee of one, two or three women could be enlisted by the health department or association to check up on what is now in use and refer lists to a competent authority for comment. The committee might go armed with copies of a small, selected list of books, pamphlets and magazines.

The page from a copy of the magazine mentioned above might be desirable. It is *free*.

"To Have and To Hold"—Under this title (*Survey*, 112 East 19th St., New York, May 15, 1931. 30 cents), Arthur Dunham tells how to handle one's personal collection of professional reference material—"notes, memoranda, manuscripts, clippings, reports." The 5 steps outlined apply equally well to the office collection of the public health worker who has no elaborated filing classification—and to the health education worker until that time when we have a topical classification on either school or public health education.

Suppose we start with cutting up the *Journal*—all the articles containing references to health education and all of the topics appearing under "Education and Publicity." We will want to subscribe for an additional copy of the *Journal* or beg the "Education and Publicity" pages from a coworker to have both sides of the pages.

Requested: the classifications used by some of our collectors of health and health education information.

Not Among Those Present-- Schools of Law, Schools of Medicine, Schools of Veterinary Medicine, Schools of Osteopathy, and others are listed but—as is the custom—schools of public health are not listed in Institutions of Higher Education, an official publication of Office of Education, Dept. of the Interior. Page Prof. C. E. Turner!

CHILDREN AND SCHOOLS

"The Nurse in the High School," by A. G. Ireland, M.D. (includes health education); "The Health Counsellor in High School," by C. M. Simon, R.N. *Public Health Nurse*, 450 7th Ave., New York. Oct., 1930.

"A Puppet Show," by C. A. Hammond. *Hygeia*. June, 1931. Details and "The Health Brownies Help" in full—as given by school children. Puppets are good for all ages.

"Summer Health Schools" (in Los Angeles County) by Alma Overholt. *Hygeia*. June, 1931. 6 illus.

"Teaching Housing to School Children," by Bleeker Marquette. What an 8th-grade course aims to do. *Journal of Home Economics*, Baltimore. June, 1931. 30 cents.

"Teaching Topics on Narcotics." *Journal of Natl. Education Assn.*, Washington. Feb., 1931. Reprint. 10 cents.

"What Can the Volunteer Agency Do to Assist State Departments of Education to Obtain Adequate Supervision of Health Teaching?" by J. E. Rogers. 8 pp. Reprint. Natl. Tb. Assn., 450 7th Ave., New York. Free.

School Hygiene Handbook—Division of Child Hygiene, Massachusetts Dept. of Public Health. 95 pp. A working manual—crammed full of detailed procedures, blank forms, condensed facts—numerous addresses given in full—index

and date! The good outline of publicity is so condensed that it lacks the detail for easy use by those more familiar with procedures in other directions. As it happens no information source is mentioned. Does not the Child Hygiene Division supply ideas or forms for some of the suggested publicity material?

EDUCATIONAL MATERIAL

Cause and Prevention of Typhoid Fever. Tennessee State Dept. of Health. 14 pp.

Coming Home from the Sanatorium—4-page folder for patient, family and friends. Natl. Tb. Assn., 450 7th Ave., New York.

What You Should Know About Tuberculosis—a 32-page pamphlet for tuberculosis patients. Natl. Tb. Assn.

Hazards of Commercial Health Advertisements, by Iago Galdston, M.D. Reprint from *Journal*. Author: 2 E. 103d St., New York. Free.

Exercises for Constipation. 4 pp. Setting Up Exercises. 4 pp. *Farmer's Wife*, St. Paul. Free. Get copies for the illustrations.

Posture and Physical Fitness. 45 pp. (Children's Bureau.) Supt. of Documents, Washington. 10 cents.

Production of Clean Milk. Revised. 18 pp. (Agriculture Dept.) Supt. of Documents, Washington. 5 cents.

Twenty Live Reasons for First Aid Training—describing successful first-aid cases. 8 pp. U. S. Bureau of Mines, Washington. Free.

Safety Consciousness—necessity of developing safety consciousness in industry. 6 pp. U. S. Bureau of Mines. Free.

The Paramount Issue—importance of educating public opinion on accident prevention. 7 pp. U. S. Bureau of Mines. Free.

A Survey of the Medical Facilities of the City of Philadelphia, by Sinai and Mills. 28 pp. A Study of Physicians

and Dentists in Detroit, by Sinai and Mills. 50 pp. The "Municipal Doctor" System in Rural Saskatchewan, by Rorem. 20 pp. Committee on the Costs of Medical Care, 910 17th St., N.W., Washington. *Free*.

Foods and Cooking—list of publications for sale by Superintendent of Documents, Washington. *Free*.

NEW

Review and Information Bulletin, League of Red Cross Societies, 2, Avenue Velasquez, Paris. This supersedes *World's Health*. Much news of public health and public health education activities from 57 countries. 25 cents; \$2.00 a year.

Almost a year old, but new to this department is *School Physicians' Bulletin*, Am. Assn. of School Physicians, State Education Bldg., Albany, N. Y.

The Health Examiner, Greater New York Committee on Health Examination, 2 E. 103d St., New York. Distributed to all practitioners in Greater New York as a feature of a 5-year campaign sponsored by the 5 county medical societies. Edited by Iago Galdston, M.D. Most of the contents useful in other cities. Free to health officials.

HONORABLE MENTION

To Department of Health, New Brunswick, Canada: for annual report with detailed table of contents.

To Quebec Provincial Bureau of Health: for yearly table of contents (two languages) of *Bulletin Sanitaire*.

CAMPAIGNS

"Doctors Here Open Health Test Drive—County Societies Join in Five-Year Campaign for Preventive Examinations—To Use Films and Radio—Welfare and Civic Groups Will Be Asked to Coöperate in Program of Public Education"—thus the *New York Times*. April 26, 1931. The Greater New York Health Examination Committee is located with the Academy of

Medicine, 2 E. 103d St., New York.

A 3-months campaign in education on syphilis and gonorrhea is reported in *An Educational Experiment in the Bellevue-Yorkville District of New York City*, by Savel Zimand. A reprint from *Journal of Social Hygiene* (March, 1931) will be supplied by the author at 325 E. 38th St., New York, who says:

Ours was merely an experiment—a beginning. We have learned a great deal from it. We hope it will be taken up by others.

Empire Health Week is reported in *Mother and Child*, London, as having been celebrated from Bath to Bagdad. Started in the United Kingdom in 1912 it has spread to Australia, New Zealand, India, Africa, Canada, and elsewhere.

Glimpses of Roll Call campaign ideas were given in *Red Cross Courier*, Washington, for Oct. 15, 1930. "The Diary of a Roll Call Chairman" brings Mr. Pepys down to date in the guise of a 1930 Red Cross chairman. Clever and stimulating.

If you have a malaria campaign ahead you will wish to look up the illustrations for "Mosquito Propagation" in *Municipal Sanitation*, 24 West 40th St., New York, Jan., 1931. 15 cents.

CONVENTIONS

School or popular health education topics are being found on many convention programs. Some recent examples:

"The Health Education Service of the Department," by Mary Power—Ontario Health Officers' Assn.

"Aids in Child Health Education," by T. J. Werle, Michigan Tb. Assn.—Illinois Tb. Assn.

"Health Education," by Saidie Orr-Dunbar, Ira V. Hiscock, H. J. Sears, Catherine S. Bastian, Arlien Johnson—Western Branch of A. P. H. A.

"Publicity in Health Education," by A. E. Wells, Manitoba Dept. of Health and Public Welfare—Canadian Public Health Assn.

"The task of national Red Cross So-

cieties in organizing and conducting campaigns to protect communities against tuberculosis, etc."—Third Pan-American Red Cross Conference.

The Connecticut, Rhode Island and Massachusetts Societies for Mental Hygiene sponsored a New England Conference on Mental Hygiene in Education, May 1 and 2, 1931.

The recent first conference of state mental hygiene societies in New York devoted one afternoon to educational and publicity topics.

The chief meeting of the season on school health education will be the section on this subject in the World Federation of Education Assns., Denver, July 27–Aug. 2. Address: Sally Lucas Jean, 200 5th Ave., New York.

If you have failed to see the folder, Why I Attend Annual Meetings, be sure to ask the A. P. H. A. for a copy.

DIPHTHERIA

Pau Diphtheria, Board of Health, Hawaii, is "the story of Honolulu's campaign." An insert "For Mainland Readers" interprets the title: "Put an end to Diphtheria"! And the report tells how nearly that was done by the use of 8 languages and many activities.

"New York City's Diphtheria Campaign," by E. F. Brown. *Quarterly Bulletin*, Milbank Memorial Fund, 49 Wall St., New York. Jan., 1931. Free. Review of the N. Y. City campaign.

Mass movements are necessary in the early stages of any new idea. Very few of us do any of the things we do by sheer force of intellect. Many of us know that we eat far too much and that two meals a day would be much better for us than three; however, when everyone else is going to the dinner table it creates a situation that makes even the most obese conspicuous unless he likewise gathers around the festive board. The same might be said of the styles in women's and men's clothing. We wear furs about our necks in July and go with our necks bare in January not for any real intellectual reason but be-

cause those in the orbit in which we wish to appear are doing it. Need I go further with illustrations of the sheep-mindedness of the human race? The street ballad "Everybody's doing it" is about as good a reason as most of us can give for many of the things we do.

As public health workers we should take advantage of this characteristic of the human mind and utilize this tendency to move *en masse* in the promotion of a sound public health program. To test out the importance of utilizing the mass movement in diphtheria prevention work, a former state health commissioner in Ohio set aside two counties for an experiment. He had the counties canvassed by lecturers, and public health nurses, distributed printed matter as near as possible, and carried on a modern diphtheria prevention campaign except that instead of utilizing the mass movement of the community, parents were *told* to take their children to the family physicians to have them immunized. Diphtheria immunization in these two counties was to be a single and individual service of the physician to the patient, without the element of mass movement being involved. At the end of a year of this type of work, careful surveys were made of the entire county which showed conclusively that slightly less than 2 per cent of the children were immunized. In the adjacent counties where the same methods were used and the impetus of mass movement in public health was tried, 95 per cent and 98 per cent of the average daily attendance at the schools were found to be immunized. Could a better picture of the importance of mass movement in public health work be required? When a piece of public health work is absolutely new, and the idea is falling on untilled soil, perhaps a campaign is the proper way to approach the problem.

—D. M. Griswold, M.D., in *Illinois Health Quarterly*, State Dept. of Public Health. January–March, 1931. Next month we will quote further from Dr. Griswold—some questionings as to campaigns.

RADIO

Every health and social agency using the radio should study "Advertising by Radio" by Orrin E. Dunlap, Jr., radio editor of the *New York Times* (Ronald Press, New York. 186 pages. \$4.00). There is no direct instruction for the health or social worker, but numerous

indirect suggestions and much valuable information. Note this: "Simplicity is what counts. . . . The radio audience care nothing for 'hifalutin' words. Talk in language everyone can understand." Check this advice with some of the selections from radio health talks which have been quoted under "Words" in this department.

Devils, Drugs and Doctors, weekly radio talks by H. W. Haggard, M.D., are supplied upon request in perforated loose-leaf form, by Eastman Kodak Co., Rochester, N. Y. Why are so many thousands of hearers so interested that they write for copies of these broadcasts?

He who plans a local series of broadcasts (or brief newspaper releases) on health superstitions will find useful material in *Hygeia*, including "Ghosts and Gods, Astrologers and Miracle Men," by Otto Neustätter. June, 1931. Illustrations from International Hygiene Exposition.

A radio course in mental hygiene is based on a series of 8 broadcasts by Dr. H. B. Elkind, Massachusetts Society for Mental Hygiene. Radio audience students register by sending \$1 to State Division of University Extension, State House, Boston. They receive printed information on which each lecture is based and instructions for required home work.

"A Revealing Smile" (5 minutes on mouth hygiene). *Connecticut Health Bulletin*, Hartford, Jan., 1931.

"Getting Along With People"; "Those Human Spark Plugs"—Connecticut State Dept. of Health.

"The Great Unknown" (mental hygiene); "A Legend of the Great East Gate" (germs); "Measles Is a Dangerous Disease"—New York State Dept. of Health.

"The Mechanics of Smell"; "What People Believe"; "Man's Marvelous Machinery"—broadcasts by American Medical Assn.

"Fatigue and Worry"; "Fatigue and the Blues"—Public Charities Assn. of Pennsylvania, Philadelphia.

"Some Fundamental Principles of Child Training" is a radio topic announced by a health agency. *Will someone re-write the title so that parents will be inclined to tune in?*

One wonders who tuned in on a recent radio talk on "Hygienic Adjustment Throughout Life"?

Debates, speakers, music, comment on current problems, and answers to questions from the radio audience make up the weekly program of the very successful radio Community Forum of the St. Louis Community Chest. To be studied by a group of health agencies, or health and social agencies ready to invest generously in brains and time. Annual report *free*.

Much information about education in general by radio is available upon request to Office of Education, Washington, D. C., and National Committee on Education by Radio, 1201 16th St., N.W., Washington, D. C.

Illinois Society for Mental Hygiene broadcasts through Station WMAQ, Monday, 5:45 p.m., C. S. T.

Minnesota State Medical Assn. broadcasts over WCCO, Wednesday, 11:45 a.m.

MAGAZINE ARTICLES

"The Family Doctor," by Dr. Winford H. Smith. *Saturday Evening Post*. May 16, 1931. The complicated cost of medical care.

"How to Pick a Doctor," by C. Houston Goudiss. *Literary Digest*. May 30, 1931. From *The Forecast*, New York. Well worth looking up.

"The Right to Drive," by R. S. Kirby. *Atlantic*. April, 1931. Automobile accidents largely due to lack of concentration, caution, consideration.

"The Slender Waist: How to Regain It," by Dr. G. F. Alsop. *Woman's Journal*, 171 Madison Ave., New York. March, 1931. Includes simple exercises.

BOOKS AND REPORTS

The Principles of Epidemiology and the Process of Infection—*By C. O. Stallybrass, M.D., D.P.H. New York: Macmillan, 1931. 696 pp. Price, \$8.50.*

We have here an exceptionally good book, following in many respects new lines. While we cannot entirely agree with the definition of epidemiology given, we are not inclined to find serious fault with it, though it seems to have furnished the reason for burdening the text with some material which might have been better treated elsewhere.

Chapter III, of 47 pages, is devoted to statistical methods, the understanding of which is doubtless of value to every health officer, but which we believe has no place in a book of epidemiology. In a number of other places, statistical material is brought in, and Appendix I is a table for calculating probable error. Appendix II gives the classification of pathogenic bacteria and there is some discussion in the body of the book on bacteriological and mycological classification and nomenclature which it seems to us might well have been omitted. We are doubtful concerning the propriety of including the long discussion of specific resistance in which we find several of the leading theories of immunity, anaphylaxis, etc.

The greater portion of the book, which is devoted to what is really epidemiology, is unusually good and well put, and may be regarded as a series of masterly essays which show deep study and wide experience.

Without any desire to lessen the credit of Semmelweiss, we must point out the well known fact that the credit of having first called attention to the contagious nature of puerperal fever belongs to Oliver Wendell Holmes, who

in 1843 wrote: "The disease known as Puerperal Fever is so far contagious as to be frequently carried from patient to patient by physicians and nurses."

There are some omissions such as that of the name of Agramonte from the United States Army Commission appointed to study yellow fever. A number of misprints of proper names also occur, as Desonbry for Desoubry, Lazcar for Lazear, and B.C.G. for BCG.

The book is primarily intended for the medical officer of health and is written from the English standpoint, though American and other foreign authors are fairly treated. In addition to his own extensive experience, the author has availed himself of the assistance of several noted bacteriologists and epidemiologists.

The book ends with a fairly good bibliography and index of authors, as well as a subject index. Altogether we consider it one of the best books for its purpose which has come to our attention. It is attractively written and well illustrated with charts, diagrams, and a few colored plates. M. P. RAVENEL

The Physical Basis of Personality—*By Charles R. Stockard. New York: W. W. Norton & Co., Inc., 1931. Price, \$3.50.*

This is A Scientific Book Club Selection, and may well be read in connection with *Biological Basis of Human Nature*, by Jennings. The two are similar in field and in treatment. In this book the ability of environment, especially prenatal, to modify what might be considered as normal development and thus alter in various ways different individuals of identical genetic heritage, is emphasized. It is the outcome of the series of Lane Medical Lectures given

by the author at Stanford University, in 1930, rewritten and rearranged, however, in order to adapt it to the more general reader.

The author has succeeded in this object as far as is possible. It is useless, however, to claim that the material in Chapters III and IV, for example, is easily understood unless one has had some groundwork in biology. The matters discussed have puzzled physiologists and psychologists, and there is not even now agreement on some important points.

The known facts are here clearly given and a recognition of them would avoid the errors indulged in by many who consider themselves trained scientists. The subjects of senility and rejuvenation are considered, and it is clearly shown that the sex gland rejuvenation idea is based on an entirely erroneous conception.

The author is a well known anatomist, and his statements carry the weight of authority. The volume can be commended to all interested in the subject, and perforce all must be whether they recognize it or not. The printing and make-up of the book are excellent, the illustrations abundant and good.

ALLEN E. STEARN

Noguchi—By Gustav Eckstein. New York: Harper, 1931. 418 pp. Price, \$5.00.

This account of Noguchi and his work is written by a man who, according to his own account, was a dentist, studied medicine, and taught physiology, though he confesses that he "learned not much," but later "learned prodigiously" from making friends with two rats.

The book shows vivid imagination, and the jacket displays something of the same characteristics. The writer puts what he has to say in an interesting and often fascinating way. The style may be described as a succession of superlatives in staccato. Our objec-

tion to books of this type is that, being written for laymen who do not know the facts and are not able to analyze the statements made, wrong impressions of medical history are given.

It is perfectly true that Noguchi had quite a remarkable career. He was an indefatigable worker, did experiments on a grand scale, and undertook the solution of most difficult problems. His reputation will rest chiefly on his having been the first to cultivate artificially the germ of syphilis, and to demonstrate that this germ could be found in the brain matter of those suffering from general paralysis of the insane. The accuracy of much of his other work is extremely doubtful, and some of it known to be positively erroneous. His alleged discovery concerning the germ of yellow fever has been proved to be entirely wrong, and one cannot but regret that a man who had done so much that was good should have come to the end of his life under the shadow of such a mistake. It was a tragedy.

He overcame in a remarkable way the injury to his hand by a burn and his sensitiveness to the resulting deformity. It came near to causing his exclusion from the United States. The late Dr. J. J. Kinyoun of the U. S. Public Health Service was quarantine officer when he arrived, and hesitated a long time on this account before admitting him to the country.

The book is beautifully printed and illustrated.

M. P. RAVENEL

Silicosis. Records of the International Congress Held at Johannesburg, 13-27 August, 1930—By The International Labour Office: Studies and Reports, Series F. (Industrial Hygiene) No. 13, Geneva, 1930. (World Peace Foundation, 40 Mt. Vernon St., Boston) 694 pp. + 40 pp. of plates. Price (paper), \$1.00.

This is a report of a congress of some

50 world experts on silicosis, about half of whom were listed as members, representing Australia, Canada, Germany, Great Britain, Italy, Netherlands, Union of South Africa, and the United States of America. The balance were designated as observers who were from South Africa and also took an active part.

While the International Labour Office has followed closely the developments in silicosis throughout the world it was especially at the suggestion of Dr. Orenstein and the invitation of South African authorities, both official and industrial, that the congress was called. Dr. G. L. Ervine (Chairman of the Miners' Phthisis Medical Bureau, Johannesburg) was elected chairman of the conference and Prof. G. Loriga, Italy, and Sir Spencer Lister, England, vice-chairmen. There were 13 sittings held during the conference, the reports of which comprise 103 pages of the report. These include the chairman's address by Dr. Ervine and oral and written discussions upon the subjects of occupational conditions and methods of dust prevention, preventive measures, etiology and pathology of silicosis, its diagnosis as an occupational disease, statistics, and a draft report on preventive measures and compensation. The familiar name of A. Mavrogordato occurs frequently in the hearings, but we miss that of Haldane, who, however, was in South Africa the year before at another conference on the same subject.

The balance of the report contains some 20 major papers presented by experts in Johannesburg, and 14 special papers by the representatives of the various other countries named. These papers deal with practically all phases of the subject from historical aspects to sanatorium treatment, compensation, and actuarial valuation. Many tables, diagrams, bibliographies, and numerous half-tones accompany. There is no index but a brief table of contents and a list of members and observers are given,

as well as a verbatim copy of the entire transactions.

On page 562, Dr. Russell, of the U. S. Public Health Service, presents an interesting table of the industrial uses of silica and the types of silica used. An appendix on asbestos dusts is given by Dr. L. A. Garden and Dr. Donald E. Cummings of Saranac Lake.

The volume may well be considered as containing the last word in the world's knowledge of silicosis. It is printed in large type, very well edited and invaluable to those interested. It should dispose of the doubts which seem to exist in this country of the existence of silicosis as a disease entity and of the ability to compensate it fairly in view of the fact that the South African Bureau is now expending about a million pounds per year on the compensation features.

EMERY R. HAYHURST

William Henry Welch at Eighty—
Edited by Victor O. Freeburg. Published for the Committee on the Celebration of the Eightieth Birthday of Doctor William Henry Welch by the Milbank Memorial Fund, New York, 1930. 230 pp., 14 pl.

For his fine courage and rare ability to pursue truth into its innermost fastness, his broad vision of scientific conquests for the practical benefit of humanity, his warm zeal for discovering and developing the strength of others crusading for health, his charming genius for friendship, and his modesty, marked as his greatness, Dr. William Henry Welch has long been the recipient of cumulating honors and felicitations. When he reached the age of 80, on April 8, 1930, it was but natural that the legions of his followers, colleagues, personal friends and admirers should pay their tributes more abundantly than ever before.

A selected group of the most distinguished men in science, literature, statesmanship and the affairs of business and

philanthropy arranged the celebration for Dr. Welch's 80th birthday. Exercises to commemorate the event were world-wide. At Washington the speakers were President Hoover, Livingston Farrand, Simon Flexner and John A. Kingsbury. The book contains their tributes as well as Dr. Welch's charming and impersonal reply. In addition to the ceremonies at Washington, like gatherings were held simultaneously at the New York Academy of Medicine, the London School of Hygiene and Tropical Medicine, the Pasteur Institute at Paris, the Peiping Union Medical College at Peiping, China, the Kitasato Institute at Tokyo, Japan, and many other centers of medical education. Accounts of these observances are also included.

Theobald Smith says that the attempt to describe in a few words the place which belongs to Dr. Welch must necessarily degenerate into gesture (page 46).

The frontispiece of Dr. Welch, a reproduction of an etching by Alfred Hutty, is both a speaking likeness and a distinguished work of art. The book is admirably printed, exceptionally well edited and has a good index.

M. J. ROSENAU

The Prevention of Disease in the Community—By *Curtis M. Hilliard*. New York: McGraw-Hill, 1931. 193 pp. Price, \$1.75.

This small handbook is intended to give students a general idea of what is meant by public health. Students hear a great deal about personal health but often very little about health as it concerns a community as a whole or groups of persons in the community. This book is well adapted to give such general information. It is based on the scientific knowledge of disease and the most generally accepted methods for disease control.

It would probably have been more valuable if there were more references

to the sources from which information was drawn and a short bibliography outlined for those who might wish to get a more extended knowledge of the subjects treated.

The text has not been carefully edited, as there are a number of examples of inexactness of expression and of omissions. The table on page 159 does not state that the figures are per 100,000 population; on page 168 a table is called a diagram. It is barely correct to call toadstools (page 118) a food, or to suggest, as on page 120, that "such infectious origins should be discovered and condemned before the products can be used for food." They should be condemned to prevent their being used as food. Again, it is not fair to leave the impression, as on page 177, that the U. S. Public Health Service has been the only or always the main agency in getting the over 500 county health departments established in the United States. In some states this has been done by the state itself and in some counties by the county itself, in others by some of the agencies mentioned on page 188 or by other agencies. The U. S. Public Health Service has been, and at present is, especially active in stimulating states and counties to adopt the plan, but that Service is far from claiming the credit for all that has been done along that line.

There are a few places where the form of expression could be improved, as on pages 14 and 71, but outside of a few minor defects, easily corrected, the book is an interesting and instructive presentation of the subject.

JAMES WALLACE

Report of the Westchester County Sanitary Sewer Commission—November 20, 1929, to December 31, 1930.

Several records are claimed in the 1930 report of the Westchester County Sanitary Sewer Commission. One of these is the longest submarine sewer out-

fall, which is 2.42 miles long, 54" in diameter, and discharges into 51' of salt water on the Mamaroneck Valley project. Another is the longest sewer tunnel, extending over 5 miles under Mount Vernon and conveying sewage from Hutchinson Valley to the Hudson River. Still another is the largest self-contained sewage sterilization plant under one roof. This is the joint sewage treatment plant at Yonkers, where the following process is in effect:

1. Preliminary sedimentation with coarse screening
2. Fine screening with dewatering and incineration
3. Effluent disinfection with chlorine under laboratory control
4. Remote submarine discharge with deep salt water dilution

By the coming summer all pollution will be eliminated from the shore of Long Island Sound in Westchester County and the first steps taken to eliminate similar pollution of the Hudson, at Yonkers.

At the close of 1930 appropriations of \$23,670,925 had been received. A little over half has been spent. The largest single contract was for \$985,000 for the North Yonkers Tunnel. Much work had to be done by divers, and quicksand offered serious obstacles.

L. M. FISHER

Der Mensch. Vom Werden, Wesen und Wirken des menschlichen Organismus. *Herausgegeben vom Deutschen Hygiene-Museum, Schriftleitung: Dr. med. Martin Vogel, Wissenschaftlicher Direktor. Leipzig: Johann Ambrosius Barth, 1930.* 420 pp. Price, 47 marks.

One of the most interesting developments in the public health movement in Europe was the International Hygiene Exposition held last year in Dresden. It resulted in the permanent establishment of the Hygiene Museum. A book has recently been published which em-

bodies and illustrates much of the material which is on exhibition in the museum. There are 65 colored plates and over 300 other beautiful illustrations.

The first part of the volume deals with the structure of the cells and the tissues of the human body and with the functioning of the different organs. The second part sketches briefly the history of life upon the earth and traces the development of man from prehistoric times. The book is not a textbook but is written in a simple manner, utilizing the collections of the museum to arouse the interest of people and to teach them the important facts which they should know about the anatomy and physiology of their bodies. One of the most useful purposes of the book, however, is to bring to those of us who were not fortunate enough to visit the Dresden exposition an idea of what was accomplished there. It is a book that should prove of value to all public health workers.

DR. FELIX TIETZE, VIENNA

Proceedings of Eighth Annual Short School, Texas Association of Sanitarians, Amarillo, Texas, August 26, 27, 28, 1930.

The proceedings of this year's Texas Association of Sanitarians is divided into 5 major parts—waste disposal, water supplies, milk sanitation, epidemiological and laboratory studies, and miscellaneous public health problems.

In the waste disposal section a number of papers on garbage, refuse and trash collection and disposal are included. Sewage as related to irrigation is also touched upon.

Laboratory control of water supplies and the operation of swimming pools are subjects of two principal papers in the section on water supplies.

The important question of milk sanitation receives the attention of a number of writers who cover the operation of the standard milk ordinance in Okla-

homa, chemical sterilization of dairy equipment, and utensils, certain milk tests and discussions of certified milk, and dairy barn and milk house construction.

The remaining two sections of the transactions cover a miscellaneous group of papers, some of which refer to epidemiological investigations and others to health education, nursing, mosquito eradication and rodent control.

ARTHUR P. MILLER

Handbook of Protozoölogy—By R. R. Kudo. Springfield: C. C. Thomas, 1931. 451 pp., 175 ills., 1463 figs. Price, \$5.50.

This handbook differs from others in its field in being primarily a systematic résumé of this large group of animals. It is also characterized by its wealth of illustrations of representative, significant, and interesting species. The illustrations, though of necessity simplified, are uniformly of excellent quality both in the technic of drawing and in the quality of the reproduction and printing. Magnifications are always given and related forms grouped for comparison. This wealth of illustration and the wide range of material included give to Dr. Kudo's book a uniquely useful place both for laboratory instruction and as a work of reference.

C. A. KOFOID

Jamaica Health Stories and Plays—By B. E. Washburn, M.A., M.D., Rockefeller Foundation. Printed and Published by the Government Printing Office, 1929. 110 pp. Price, \$1.00.

This is a collection of health stories and plays, the former printed in the *Jamaica Public Health* through several

years; the latter given in the schools of the colony during the year of 1927-1928. While local interest is chiefly kept in mind and the material is, therefore, specifically applicable to meeting demands in Jamaica, the book offers much of value to any instructor who aims to arouse a live attitude toward disease prevention and personal hygiene among students of younger age.

LENNA L. MEANES

Elements of Water Bacteriology with Special Reference to Sanitary Water Analysis—By Samuel C. Prescott and Charles-Edward A. Winslow. (5th ed., rev.) New York: Wiley, 1931. 219 pp. Price, \$2.50.

This book, which has now reached its fifth edition, has been a laboratory essential for more than 20 years. This new edition maintains the standards set by the preceding ones, and doubtless the work will continue to hold the position so deservedly won.

The chief changes are to be found in Chapter V, which is devoted to the colon group, its classification and methods of isolation. We wish a fuller discussion of the Dominick-Lauter medium had been given. The method described by Dr. A. J. Salle, which had not been published when the manuscript was prepared, has been accepted at its face value, though the text gives no evidence that it has undergone the criticism of other workers. According to the authors, it "appears to show a marked superiority" over that given in *Standard Methods* of the American Public Health Association.

The printing and make-up of the book are excellent. M. P. RAVENEL

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Tennessee—The biennial report of the State Department of Public Health for the period ending June 30, 1929, occupies 154 pages of carefully prepared information, well printed. Infant mortality rates of 72.2 and 77.6 are noted for the years 1927 and 1928. An outbreak of influenza at the close of 1928 was the only important epidemic for the biennium. The number of cases and deaths from typhoid showed a notable decrease, as did most of the other communicable diseases. Tuberculosis remains an important problem, with a rate of 134. An annual per capita expenditure of \$.103 by the Department of Health in 1928 is compared with an average for 12 southern states of \$.136. Special efforts are described to secure the coördination of administrative affairs and the development of new programs and proper relationships with other agencies, including the medical profession.

Through the Division of Administration, a study is routinely made of the relationship of all new work to the program as a whole. Periodic studies are made as to the effectiveness of the various health projects of the department. Through conference and current reports, duplication of effort on the one hand, and program gaps on the other, have been avoided.

Success continues in the development of local health service.

Being entirely in line with the principles of democratic government which demand local responsibility and privilege, the county and city health departments have increased in efficiency and a greater number of citizens are each year being brought under the influence of reasonably adequate local health service. . . . In general, then, it may be said that the provision of local health service has proved itself sound and the outlook for continued and wider service is especially good in those counties containing at least \$10,000,000 assessed

valuation. In the smaller and not so wealthy counties, the problem remains difficult of solution. For instance, in a county with only some 3½ millions of taxable wealth, a tax rate of a little more than \$14 on the \$100 would be necessary to produce one-half of a minimum budget. As most of such counties are already struggling under relatively high tax rates, their ability to increase the county's income in order to provide for health service is definitely limited. To meet this situation, temporarily, the department has tried two plans: (1) Furnishing service only along special lines, as sanitation, public health nursing; and (2) by combining two or more counties into health department districts.

The report is well illustrated with excellent graphs, photographs and statistical tables. The general objective of the state health education program is to carry to the people of the state, both directly and indirectly, understandable information as to the fundamentals of health protection and disease control so that this knowledge may become usable as an integral, habitual part of daily life; and further to give sound information on public health problems and procedure, to the end that each county may provide its citizens with adequate health service. The program includes teacher training, health lectures in classrooms, classes in home hygiene, a public information service, personnel training, and consultant service.

New Brunswick, Canada—The construction of a new laboratory in conjunction with the new general hospital of Saint John is one of the outstanding events of the year, mentioned in the 1930 report of the Chief Medical Officer to the Minister of Health. Active immunization campaigns have been conducted in various districts resulting in the protection of some 35,000 children under the auspices of the Department of Health.

Efforts of travelling clinics are credited with much of the success in reducing tuberculosis mortality in the area to 84. Besides the diagnostic work associated with these clinics, efforts have been made to further health instruction. Over 54,300 school children were also given medical examinations and some 10,000 were vaccinated against smallpox. "Smallpox continues practically not to exist with us."

A birth rate of 24.4 and a general death rate of 12.5 are recorded.

Hawaii—The Territory of Hawaii, with a 1930 population of 370,620, records in the annual report of the Board of Health a birth rate of 29.6 and a death rate of 10.8. The infant mortality was 87.4 as compared with 101.7 in 1929, decrease for all races being noted except among the Portuguese and Hawaiians.

The control of tuberculosis is recognized as a health problem of first importance. Hence the director devoted considerable time to educational activities. A pamphlet, *What You Should Know About Tuberculosis*, was published in English, Japanese, and Filipino languages and widely distributed. The focus of publicity through the press was turned upon childhood tuberculosis. A new film was shown in the schools and before parent-teacher groups. Pamphlets and posters in schools, libraries, the Y. W. C. A., and in street cars were utilized. Special courses and lectures were given to nurses, physicians, and lay groups. On July 1, 1930, there were 2,325 active cases on the register, while 392 deaths occurred during the year, a decrease of 15 over the previous year. The problem is carefully analyzed in the report. A school survey was undertaken with the aid of funds from the American Association of University Women, in cooperation with the Boards of Education and Health. This work included tuberculin tests and X-ray examinations

(1,189). Through the coöperation of official and voluntary agencies, a preventorium was opened.

In the public health nursing field, generalized nursing was adopted in Honolulu through the pooling of nurses of the Board of Health and Palama Settlement; additional nurses, including supervisors, were added; prenatal clinics were opened on the island of Kauai, and improvements were made in the methods of health examination of school children. This is an excellent report of progress containing many valuable statistical tables, charts and photographs, with interesting descriptive text.

Newton, Mass.—In the 1930 report, a death rate of 8.3, the lowest in history, is recorded. This figure is based on a population of 65,763. A classified financial statement indicates an expenditure by the Health Department of \$.57 per capita. There were only 3 cases of diphtheria reported, with no deaths. Immunization work was continued. There were 80 cases of scarlet fever reported, with no deaths. The difficulty of detecting mild cases in the early stages of this disease is emphasized.

Physical examinations of school children revealed 5.7 per cent in all public schools to have physical defects as compared with 9 per cent among junior high school pupils. An infant mortality rate of 29.9 for the year is noteworthy.

Arizona—In 1930, through the aid of funds from the U. S. Public Health Service, a state-wide immunization campaign was organized which resulted in 38,904 diphtheria immunizations, 16,443 smallpox vaccinations, and 12,307 typhoid inoculations. Six schools were immunized 100 per cent against three diseases, and several others to the extent of 98 per cent.

During the year, the new State Building was completed, in which quarters were provided for the State Board of

Health on the first floor. A coöperative laboratory unit was established with the city of Phoenix and Maricopa County and the State Dairy Commissioner. In November the State Board of Health maintained an exhibit booth at the State Fair in collaboration with the State Medical Association. Approximately 50,000 pieces of health literature were distributed during the week.

Commonwealth Fund—New developments in the field of public health, with effort particularly devoted to the building up of better health service for rural communities, are described in the twelfth annual report of the Commonwealth Fund. Coöperative arrangements have been established during the year with the state health departments of Tennessee and Massachusetts whereby in each of these states intensive work has been undertaken in two rural districts, and special provision has been made for the training of rural physicians. The selection of other states for similar coöperative effort is pending. According to the report:

It is the interplay between public health and the private practice of medicine that gives the new health program its distinctive character. The problem of the typical rural community is to make use, more deliberately and more wisely, of all the available resources for the promotion of health and the cure of disease. The rural physician has usually defended his patients single-handed against illness and premature death. He must always carry the major responsibility, but he need not stand alone, and if he can get a firm grasp of modern medical technique, he may be able to move forward from his defensive position and lead an aggressive attack on disease.

Under the program initiated by the Fund, the local health authorities in each of the selected rural districts will be aided to develop their service to the point of greatest usefulness within the limits of sound budgeting, on the understanding that all expenses, during the

introductory period, will be shared between the county, the state, and the Fund.

In each state, 15 scholarships will be provided annually for rural physicians, 5 in each of the special districts and 5 in the state at large. The medical school chiefly responsible for the training of rural physicians in each of these states will be helped to develop its teaching of preventive medicine and its facilities for postgraduate training. Scholarships or loan funds will be provided for undergraduate students of medicine who agree to go into rural practice. Scholarships for postgraduate nursing study will also be offered.

The new program follows and supplements work which the Fund has been doing for some years in the field of child health and in the establishment of rural hospitals, 6 of which have now been built through the assistance rendered to various communities. In fact, the plan for scholarships whereby local practitioners might return to medical schools for postgraduate work was started in connection with the rural hospital program, and from the 6 communities, 82 local physicians have been given the opportunity for such study.

The appropriations made by the Fund during the year totalled \$2,095,-918, covering a wide range of activities mainly in the fields of public health, mental hygiene, and British-American relations. In the field of mental hygiene, the report covers the first year's work of the Child Guidance Clinic, established in London in accordance with plans formulated by the Child Guidance Council. The Council, organized by the Fund, serves the whole of Great Britain; it gives advisory service to those interested in forming new child guidance clinics and coöperates with the London School of Economics and Political Science in its training school for social workers.

Continued support has been given to

the Institute for Child Guidance established by the Fund in New York primarily to meet the great need for a larger number of well trained personnel in this field.

The efforts of the Legal Research Committee have continued to center upon projects in administrative law, including studies of the Interstate Commerce Commission, workmen's compensation laws, and the administrative

powers and methods of the Department of Agriculture. Another study made under the direction of the University of Chicago Law School and dealing with insanity as a defense in criminal law, is approaching completion. Special grants were given to 41 outside organizations, hospitals and universities for various projects. These included many research undertakings in the field of preventive medicine.

BOOKS RECEIVED

RESISTANCE TO INFECTIOUS DISEASES. 4th ed. By Hans Zinsser. New York: Macmillan, 1931. 651 pp. Price, \$7.00.

PRINCIPLES OF CITY PLANNING. By Karl B. Lohmann. New York: McGraw-Hill, 1931. 395 pp. Price, \$4.00.

THE TREATMENT OF BEHAVIOR DISORDERS FOLLOWING ENCEPHALITIS. By Earl D. Bond and Kenneth E. Appel. New York: Commonwealth Fund, 1931. 163 pp. Price, \$1.75.

THE PSYCHOLOGY OF INSANITY. 4th ed. By Bernard Hart. New York: Macmillan, 1931. 191 pp. Price, \$1.25.

EYE, EAR, NOSE AND THROAT FOR NURSES. By Jay G. Roberts. Philadelphia: Davis, 1931. 213 pp. Price, \$2.25.

THE FAMILY IN THE PRESENT SOCIAL ORDER. By Ruth Lindquist. Chapel Hill: University of North Carolina, 1931. 241 pp. Price, \$2.50.

CHEMISTRY FOR NURSES. By Harry C. Biddle. Philadelphia: Davis, 1931. 336 pp. Price, \$2.75.

EASIER MOTHERHOOD. By Constance L. Todd. New York: John Day, 1931. 199 pp. Price, \$2.00.

THE SIGNIFICANCE OF WATERBORNE TYPHOID FEVER OUTBREAKS, 1920-1930. By Abel Wolman and A. E. Gorman. Baltimore:

Williams and Wilkins, 1931. 82 pp. Price, \$2.00.

MY HEALTH HABITS. By Charlotte Townsend Whitcomb, John H. Beveridge and Evelyn Estelle Townsend. New York: Rand McNally, 1930. Book II. 200 pp. Price, \$88. Book III. 238 pp. Price, \$96.

DIABETES AND ITS TREATMENT BY INSULIN AND DIET. 5th ed. By Orlando H. Petty. Philadelphia: Davis, 1931. 231 pp. Price, \$2.00.

MILITARY PREVENTIVE MEDICINE. By George C. Dunham. 2d ed. Carlisle Barracks: Medical Field Service School. 1062 pp.

POPULATION PROBLEMS. By Warren S. Thompson. New York: McGraw-Hill, 1930. 462 pp. Price, \$3.75.

THE COMMUNITY AND SOCIAL WELFARE. A Study in Community Organization. By Cecil Clare North. New York: McGraw-Hill, 1931. Price, \$3.50.

HEALTH STORIES AND PRACTICE. By William E. Burkard, Raymond L. Chambers and Frederick W. Maroney. New York: Lyons and Carnahan, 1931. 256 pp. Price, \$76.

PRINCIPLES AND PRACTICES IN HEALTH EDUCATION. From the Sixth Health Education Conference, Sayville, Long Island, June 16-21, 1930. New York: American Child Health Association, 1931. 485 pp. Price, \$1.50.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Diphtheria Mortality Rates—The annual tabulation of diphtheria death rates for large cities reveals the lowest rate ever recorded, about half that of 5 years ago. Whether this is due to the general use of toxoid and toxin-antitoxin or to a decrease in general susceptibility remains to be proved. But the figures encourage the extension of the prophylactic program.

ANON. Diphtheria Mortality in Large Cities of the United States in 1930. *J. A. M. A.*, 96, 21: 1768 (May 23), 1931.

Typhoid Fever Mortality—The annual compilation of typhoid fever mortality rates for the large cities of the country in 1930 shows the usual interesting statistics. The rate for the entire country is the same as that for 1929.

ANON. Typhoid in the Large Cities in the United States in 1930. *J. A. M. A.*, 96, 19: 1576 (May 9), 1931.

Physical Defects and Sex—Rates of physical impairment are higher for women than for men, notably so in respect to thyroid conditions, visceroptosis, edema, adenitis, varicosities, heart conditions, tuberculosis, etc. The rates for men were greater in the case of urine casts, defected septum and arterial thickening.

BRITTEN, R. H. Sex Differences in the Physical Impairments of Adult Life. A Comparison of Rates among Men and Women Based on 112,618 Medical Examinations by the Life Extension Institute. *Am. J. Hyg.*, 13, 3: 741 (May), 1931.

About Leprosy—A non-technical discussion of leprosy and control measures.

FORD, W. W. Leprosy in the United States. *Sci. Monthly*, 32, 6: 513 (June), 1931.

Weather and Colds—Evidence is presented which suggests that changes in weather during a warm season are probably associated more closely with common cold incidence than weather changes during the season of low temperature.

GAFATER, W. M. Upper Respiratory Disease (Common Cold) and the Weather. Baltimore, 1928-1930. *Am. J. Hyg.*, 13, 3: 771 (May), 1931.

Bacterial Content of Dry Milk—About 200 samples of dried milk preparations used in infant feeding were tested. The total bacteria count varied from 1,000 to 10,000 bacteria per gm., but no pathogenic streptococci or tuberculosis bacilli were present.

GIBLIN, J., and VON POURTALES, J. H. Dried Powdered Milk Preparations Used in the Feeding of Infants. *Am. J. Dis. Child.*, 41, 5: 1100 (May), 1931.

Preschool Health Education—How constructive are health songs, plays and pageants? This paper answers the question so far as preschool ages are concerned.

HARLEY, W. Health Education for Preschool Children. *Pub. Health Nurse*, 23, 5: 213 (May), 1931.

Urinalyses and Health—The limitations of the urinalysis as a health index as well as its place in health diagnosis are both covered in this brief paper.

KILDUFFE, R. A. Urinalysis as an Index of Health. *Am. J. Nurs.*, 31, 5: 563 (May), 1931.

The Laborer is Worthy of His Hire—Physicians in public health receive the lowest average income of any in a salary survey of a large medical

group. However, the health official's salary, which is net, is compared with the gross income of private practitioners the median of which is \$6,500-\$7,500.

LELAND, R. G. Income from Medical Practice. J. A. M. A., 96, 20: 1683 (May 16), 1931.

Progress in Public Hygiene—The events of the year 1930 are reviewed briefly; the fields covered are public health measures, private and clinic practice, legal measures, awards, and research. A most useful reference paper.

MOORE, H. H. Progress during 1930 in Medicine and Public Health. New England J. Med., 204, 19: 994 (May 7), 1931.

A City's Health Progress—Originally surveyed in 1923, resurveyed twice since to establish progress along lines laid down, Knoxville was given another going over to estimate achievement as originally projected and to help arrive at a continuing program. A record for periodic health examinations, it would seem.

MOUNTIN, J. W. Public Health Progress in Knoxville, Tenn. Pub. Health Rep., 46, 20: 1150 (May 15), 1931.

Septic Sore Throat Outbreak—An explosive outbreak of septic sore throat causing 450 cases with 4 deaths in Canada is reported. Infected raw milk was the avenue of spread, the suggestive evidence indicating a cow's udder infected by human carriers.

McKAY, A. L., *et al.* A Septic Sore Throat Epidemic. Canad. Pub. H. J., 22, 5: 224 (May), 1931.

County Health Administration—That the appraisal form, as applied to one Tennessee county, helps to maintain a balanced program is the opinion of this health officer.

ROBERTS, F. L. Criteria for Maintaining Balance of Program in County Health Departments. Pub. Health Rep., 46, 19: 1079 (May 8), 1931.

Toys for Toddlers—Ask of each toy: what can the child do or make with it? Is it suited to the preschool age? Good toys are fraught with the highest educational possibilities.

ROBINSON, M. H. Educational Play Materials for the Preschool Child. Pub. Health Nurse, 23, 5: 219 (May), 1931.

Chance of Brucella Abortus Infection—In Denmark 272 persons working with cattle were tested for *Br. abortus*; 94 per cent of a group of veterinarians in rural practice reacted positively. Other groups responded in proportion to the exposure to sick cattle. Milk had no proved connection with the reactions.

THOMSEN, A. Correlation of Occupation with Serologic Reactions for *Brucella abortus*. J. Infect. Dis., 48, 5: 484 (May), 1931.

More About Scarlet Fever—This Japanese study of the etiology of scarlet fever confirms American opinion of the rôle played by the scarlatinal streptococcus.

TOYODA, T., *et al.* Scarlet Fever. Am. J. Dis. Child., 41, 5: 1009 (May), 1931.

Use and Danger of Fumigants—How to use hydrocyanic acid and how to avoid the dangers incident to fumigation with this substance are clearly set forth in this paper.

WILLIAMS, C. L. Fumigants. Pub. Health Rep., 46, 18: 1013 (May 1), 1931.

Tuberculosis Case-Finding—Reviewing the 7-year record of the Chadwick clinics in Massachusetts, the author concludes that nothing really new has been learned, but what is shown (and most graphically, too) is that a comprehensive control program is badly needed if youth is to be saved from tuberculosis. A paper all should read and ponder over.

ZACKS, D. What We Have Learned from the Ten-Year Program in Massachusetts. New England J. Med., 204, 20: 1037 (May 14), 1931.

NEWS FROM THE FIELD

NEW SURGEON GENERAL FOR U. S. ARMY

DR. ROBERT U. PATTERSON has been appointed Surgeon General of the United States Army by President Hoover, with the rank of Major General, succeeding Dr. Merritte W. Ireland.

SICKNESS AMONG INDUSTRIAL EMPLOYEES

ACCORDING to the U. S. Public Health Service, a favorable health record among industrial workers during the second half of 1930 is indicated from reports of a group of industrial sick benefit associations covering about 135,000 male industrial employees.

RESEARCH FUNDS

THE Elizabeth Thompson Science Fund of Harvard University and the Sugar Institute are the latest donors of research funds to Dr. Harry J. Deuel, Professor of Biochemistry in the School of Medicine, University of Southern California. Previously the National Research Council and the Committee on Scientific Research of the American Medical Association made grants to him.

The funds are being used by Dr. Deuel to further his research in the antiketogenic value of carbohydrates. He had for his purpose the determination of the power of various sugars to reduce acidosis produced in individuals by a uniformly protein-fat diet.

SOCIAL HYGIENE

THE Massachusetts Society for Social Hygiene announces a competition, with a prize of \$500, for a suitable manuscript on the subject of sex hygiene for adolescent boys and girls.

The contest will close October 1, 1931, and the prize will be awarded January 1, 1932. Further particulars may be obtained from the Massachusetts Society for Social Hygiene, 1150 Little Building, Boston, Mass.

AMERICAN COLLEGE OF PHYSICIANS

THE American College of Physicians will hold its Sixteenth Annual Clinical Session at San Francisco with headquarters at the Palace Hotel, April 4-8, 1932. Following the Clinical Session, a large percentage of the attendants will proceed to Los Angeles where a program principally of entertainment will be furnished April 9, 10 and 11.

E. R. Loveland, Executive Secretary, 133-135 S. 36th Street, Philadelphia, Pa., is in charge of general and business arrangements, and may be addressed concerning any feature of the forthcoming Session.

ADVANCEMENT OF SCIENCE CENTENARY

THE British Association for the Advancement of Science will celebrate its centenary with a meeting in London, September 23-30, 1931. Particulars may be obtained on application to the Secretary, British Association, Burlington House, London, W.I.

NEW CRIPPLED CHILDREN'S HOSPITAL

A NEW \$300,000 Wisconsin Orthopedic Hospital at Madison, Wis., is to be opened early this summer, according to a report from Wisconsin. It will have a solarium, open sun porch, playroom, and rooms for occupational therapy. One of the most sensible ideas carried out in this hospital is the reservation of the ground floor for patients who are able to get out of doors.

The building has a capacity of 113 beds, which will make hospital care available to many crippled children for whom facilities heretofore have been lacking.—U. S. Children's Bureau, Washington, D. C.

TEXAS SANITARIANS TO MEET

THE Ninth Texas Sanitarians' Short School will be held at Houston, with headquarters at the Rice Hotel, November 9-14, 1931, under the auspices of the Texas Public Health Association, with the Texas State Department of Health and the City of Houston co-operating.

The Short School will be conducted as two sessions this year, Laboratory and General, intended to embrace the general phases of public health activities such as nursing and welfare, food protection, laboratory control, and milk sanitation. Special attention is expected to be devoted to those attendants desiring instruction in laboratory work either for milk, sewage or water analysis.

AUXILIARY WATER SUPPLIES IN DROUGHT AREA

THE 1930 Annual Report of the Division of Sanitation of the State of New York brings out the striking fact that although many communities were obliged to resort to polluted auxiliary water supplies during the drought last year, not a single outbreak of water-borne disease resulted from their use. This was doubtless due to the prompt reporting by communities of intention to use auxiliary supplies and the installation by the division of emergency apparatus for the sterilization of the water. The work of supervising public water supplies increased considerably, owing to the drought and a total of 579 inspections was made, over 150 more than in 1929.—*Health News*, May 11, 1931, New York State Dept. of Health, Albany, N. Y.

CONNECTICUT CHILD-WELFARE COMMISSION

A NEW child-welfare commission has been recently appointed in Connecticut to study the child welfare progress made in the state since the recommendations of the commission of 1921 brought about sweeping changes in methods of child care. These resulted in the establishment of the bureau of child welfare, the juvenile court, and the department of special education in the public schools. The new commission, which serves without compensation, has been requested to present its report, including legislative recommendations, to the legislature convening in January, 1933.—U. S. Children's Bureau, Washington, D. C.

HEALTH FILMS BY TELEVISION

THE first known attempt in history to send health films by television was made by the New York State Department of Health over station W2XCD, Passaic, N. J., March 30, 1931.

PENNSYLVANIA SEWAGE ASSOCIATION CONFERENCE

THE Fifth Annual Conference of the Pennsylvania Sewage Association was held at State College, Pa., June 23 and 24. Among the speakers were: Frank E. Daniels, Harrisburg; Harry Krum, Allentown; Albert H. Mainwaring, Philadelphia; Roy L. Phillips, Meadville; C. F. Wertz, Philadelphia; Grant M. Olewieler, Montgomery County; Elton D. Walker, State College; F. S. Barckhoff, Salem, O.; John R. Downes, Plainfield, N. J.; and H. W. Streeter, Cincinnati, O.

THE HEALTH EDUCATION COUNCIL CONFERENCE

THE sixth annual conference of the Health Education Council was held at the Massachusetts Institute of Technology on June 5 and 6.

Dr. S. C. Prescott, head of the department of biology and public health at Massachusetts Institute of Technology, delivered the address of welcome at the opening session. In connection with the meeting there was a comprehensive health education exhibit.

The officers of the Health Education Council are: Clair E. Turner, honorary president; Ida M. Lewis, president, Brookline; Mabel E. Turner, vice-president, Lowell; and Adelaide R. Ross, secretary-treasurer, Malden.

RUSSELL SAGE FOUNDATION

JOHN M. GLENN, general director of the Russell Sage Foundation since its inception 24 years ago, has resigned that post, but will continue to serve as one of the trustees of the Foundation. Shelby M. Harrison, director of the Department of Surveys and Exhibits of the Russell Sage Foundation since 1912 and

vice-general director in recent years, will succeed Mr. Glenn as general director on September 1, 1931.

While not primarily interested in public health the Foundation under Mr. Glenn's leadership has frequently concerned itself with the health aspects of social problems. The early educational efforts of the tuberculosis movement were largely made possible by the Foundation. Movements have been fostered or studies made in such fields as the prevention of blindness, industrial accidents, work fatigue, housing conditions.

Mr. Harrison has been with the Foundation for 19 years, as director of the Department of Surveys and Exhibits, and for several years as vice-general director has been closely associated with its general management.

No change in Foundation policies is expected.

PERSONALS

FLOYD C. MILLER, of Athens, Greene County, N. Y., has been appointed a member of the Advisory Committee on Milk Sanitation of the State Department of Health.

WILLIAM L. KELLER, M.D., Colonel, Medical Corps, chief of surgical service, Walter Reed General Hospital, Washington, D. C., was the recipient of the honorary degree of Doctor of Science at the commencement exercises of the Medical College of Virginia, Richmond, closing the ninety-third session of the institution on June 2.

DR. MORTON W. BLAND, Health Commissioner of Logan and Hocking Counties, O., died April 21, at the Harding Rural Rest Home, Worthington, O.

DR. HENRY FAIRCHILD OSBORN, who on January 1, 1933, will conclude 25 years as president of the American

Museum of Natural History, New York, will relinquish his duties at that time. This was made known in the 62d annual report of the president and trustees of the museum.

RICHARD A. BOLT, M.D., Director of the Cleveland Child Health Association, will spend the summer in California. From June 22 to August 1 he is giving two courses in the summer session of the University of California at Los Angeles. One of the courses will take up elementary epidemiology and the other will deal with the field of public health in the United States.

HERMAN N. BUNDESEN, M.D., Fellow of the A. P. H. A., and President in 1928, has again been appointed to the position of Commissioner of Health of Chicago, which he held from February, 1922, to January, 1928. He has recently been Coroner for Chicago.

ENNION G. WILLIAMS, M.D., Virginia State Health Commissioner since 1908, died June 6. He was the oldest state health officer in length of service in the United States, though only 57 years of age. Dr. Williams was a member of the faculty of the Medical College of Virginia. He has been a member of the A. P. H. A. since 1905.

CONFERENCES

July 26-31, Third Congress of the Pan American Medical Association, held under the auspices of the Mexican Government, City of Mexico, Mexico.

July 27-August 2, The World Federation of Education Associations, Denver, Colo.

September 14-17, Sixtieth Annual Meeting, American Public Health Association, Montreal, Canada.

September 23-30, Centenary Meeting of the British Association for the Advancement of Science, London.

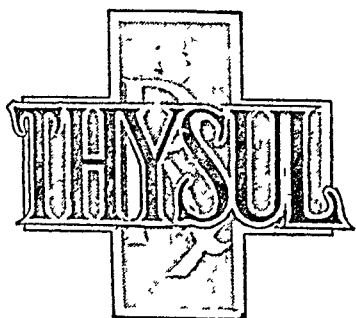
October 12-16, Nineteenth Annual Safety Congress and Exposition, Chicago, Ill.

November 9-14, the Ninth Texas Sanitarians' Short School, Houston, Tex.

July, 1932, The Second International Conference of Social Work, Frankfurt, Germany.

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American Journal of Public Health

and THE NATION'S HEALTH Vol XIII No 8

Volume XXI

August, 1931

Number 8

The Infant Before, During, and After Birth*

RICHARD ARTHUR BOLT, M. D., DR. P. H., F. A. P. H. A.

Director, Cleveland Child Health Association, Cleveland, O.

OUR present knowledge of the principles of child hygiene and the varied experience gained through their practical application to local communities during a quarter of a century, place us in a position to evaluate present trends and consider future developments. It is comparatively simple to outline a broad program for child hygiene. It is, however, quite another matter to fit such a program to the diverse needs of various types of localities, to secure adequate funds for financing measures deemed necessary, and to conduct a local organization over a sufficient period to demonstrate that our program is sound and effective.

The development of a consistent and progressive child health program over a long series of years has been carried out in so few places that it is difficult to assess with any assurance the relative values of different methods employed. Most of our efforts in this field have been either spasmodically intensive or conservatively prolonged. Progress has been made, of course, by the application of certain fundamental principles, notably in the field of infant hygiene, though much still remains to be done in the maternal, neonatal, and preschool areas.

We have been led to believe, through high powered publicity, that great strides have been made in our child hygiene work. This is undoubtedly true when applied to the care of the baby. In our prenatal program, however, and in the prevention of maternal and neonatal mortality, we have scarcely made an impression. Much progress has

* Read before the Child Hygiene Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

been made in scientific principles of infant feeding, prevention of nutritional diseases, protection of milk supplies, and technic of public health nursing. We begin to see the results of our antidiphtheria campaigns, and the protection of children against tuberculosis, but very little progress has been made in the control of whooping cough, measles, and the respiratory diseases.

The child health demonstrations which have been completed in centers throughout the country have brought us valuable data and indicate practical methods applicable to individual communities. It is essential now to show that similar methods can be applied with equal success to other places at costs which the communities can afford.

The United States as a whole reached its highest interest in maternal and infant hygiene during the years when the Sheppard-Towner Act was in force. Then it was possible to institute measures for the protection of mothers and babies in every state. A great impetus was given to child hygiene in the rural districts and small towns. Public health nursing was extended considerably. Since the expiration of the Sheppard-Towner Act it has been impossible to continue the work as extensively in a number of the states, especially in the South and West. The organization for child hygiene in some states has almost completely broken down. Much of the ground gained during the 7 years of Sheppard-Towner activity will be lost if means are not found soon to continue.

In other places, where child hygiene had been organized prior to the Sheppard-Towner Act, there is a tendency to consolidate the work and spread the general health program over the whole child hygiene field. While a great deal of interest is being expressed now as to the outcome of the White House Conference, there is no question that the child hygiene work in many communities has been retarded by withdrawal of state and federal assistance. A period of reaction has commenced which may seriously affect our whole child welfare program.

An interesting phenomenon in regard to infant mortality manifests itself in times of depression—the rates continue to fall during the period of unemployment and economic depression. This may be due to a number of factors. The impetus given infant hygiene by the prosperous years may continue. Widespread popular education in child hygiene is conducted despite the depression. Another factor, seldom stressed in connection with times of depression, is that mothers are forced to remain at home with their babies and breast feeding is encouraged. The lot of the older children, however, is not so favorable, as it becomes more difficult to feed them properly and to afford adequate medical supervision.

Our objectives in the community child hygiene program appear to be changing gradually. From a program designed primarily to prevent infant mortality, we are developing interest in the survivors. The prevention of both morbidity and mortality in older children, as well as infants, demands our best efforts. Our interest has broadened to include the whole child and all age groups.

It is, therefore, quite appropriate to consider in this paper the conditions which affect the whole child before, during, and after birth. Child hygiene, while theoretically beginning with conception, has its background in the health of father and mother and the stocks from which they have sprung. We must always reckon with hereditary factors in any inclusive program for child welfare. At conception heredity is sealed. From then on environment will modify or mold the individual along patterns which heredity has laid down. It is futile to argue which has the more influence, heredity or environment. Both are integral parts of the whole individual and act and react, one upon the other.

From conception to birth the fetus is completely environed by its mother. For all practical purposes it is a parasite, supported and protected by her. It receives nourishment, oxygen, and heat through her and is dependent upon her for the removal of its wastes. No direct nervous connection between mother and fetus has ever been demonstrated. It is quite evident, therefore, that anything we do for the child before birth must be accomplished either through heredity before conception, by means of race hygiene, or through the medium of the mother, from conception until birth. While we do not possess all of the scientific knowledge necessary to afford complete protection to the developing embryo and fetus, we do have enough to prevent many of the disasters which still occur. The earlier the prospective mother is brought under skilled medical and nursing supervision, the more opportunity we have to afford adequate protection.

Any complete community program for the hygiene of the child must begin with pre-parental and parental instruction, especially of the mother. It might well begin by providing instruction for prospective mothers, including hygiene of pregnancy and infancy. To be most effective this education should begin in the junior and senior high schools as a part of the home economics courses. Where this instruction is combined with practical demonstration in a child welfare center or nursery school, it will net the greatest returns. One of the most important functions of the public health nurse is to provide the mother with direct and practical instruction, through the health center and in the homes. No amount of broadcasting of general information on

child hygiene can take the place of personal first-hand training in a definite situation.

The educational measures which could be used to advantage may be summarized as follows:

1. Mothercraft classes in public schools, with actual demonstrations in infant welfare centers and nursery schools
2. Prenatal group instruction at health centers or in obstetric outpatient departments
3. Prenatal education by monthly letters, pamphlets, and carefully edited press articles
4. Individual instruction by doctors and nurses in private practice, and in prenatal centers
5. Encouragement for mothers to go early to their physicians for prenatal examination and have regular follow-up by public health nurses

Some form of maternity benefit or savings is urgently needed in this country to meet the extra expenses incurred during pregnancy. This need not in any way interfere with routine medical practice, nor disturb the personal relationship between physician and patient. The experience of several life insurance companies in extending prenatal and postnatal nursing care to their industrial policy holders warrants a wider acceptance of the insurance principle applied to maternity care.

Revision of birth certificates and maternal mortality reports is desirable, that they may state clearly the circumstances before and during birth. It is impossible, with our present certificates, to trace many important facts relating to physicians or others in attendance upon the mother. No information is given regarding prenatal care nor definite indications of obstetric operations performed. More detailed study of stillbirths, neonatal deaths and maternal deaths should be made by local health authorities. Publication of standardized reports from maternity hospitals and maternity homes should be made obligatory and the data and nomenclature used by all should be sufficiently uniform to be comparable.

Notification of births within from 24 to 36 hours with a report on the condition of mothers and babies would aid materially in making possible suitable nursing follow-up. This has been done in England and Scotland for some time with excellent results. Every mother should have not only a skilled, judicious physician at the time of delivery, but also a capable trained nurse, who can give postnatal as well as prenatal care. An extra pair of trained hands at delivery would also afford greater protection to mother and babe.

One of the greatest problems today is abortion. Some way to limit the number of abortions must be found if the number of maternal deaths is to be reduced. Available statistics indicate that a number of such deaths follow abortion, usually induced. Educating women to the dangers of this practice is not enough. Unless we are courageous enough to handle the abortionist as a public menace, secure his prosecution, and exclude him from our medical associations, we will accomplish little. At present the professional abortionist wears sheep's clothing. He practises on the *élite* and the *hoi polloi* alike.

Public health authorities have a right to know under what conditions mothers are being delivered and the risks to which they are exposed. They have already acquired power to inspect, license, and supervise midwives, and there is no reason why they should not know the facts regarding confinement in maternity homes and lying-in hospitals. The relative safety of such institutions should be determined by investigation by the local health authorities. The results of such a study may profitably be taken up with the medical society, together with suggestions for improvements. A detailed investigation of every maternal death would also yield valuable information which should be of service to both the medical profession and health authorities.

The problem of suitable obstetric service in rural districts can be solved to a great extent by the provision of county or district hospitals with maternity service, and by the extension of public health nursing. If the medical profession cannot meet the pressing demands of rural districts and certain areas of the South, where the largest midwife practice now prevails, there seems to be no logical reason why we should not give additional training to our registered nurses and license them to care for normal obstetric cases. This is being done with great success in a number of foreign countries and by the Pioneer Nursing Service in the Kentucky mountains. Either the medical profession must meet this emergency, or it will be solved in some other way by the community.

It is evident that there has been a diminution of the child hygiene work since the Sheppard-Towner Act expired. The appropriation in some states has been definitely cut, while in others the work has been hampered through political motives. While theoretically each locality should look after its own maternity and child hygiene problems, this is practically impossible in small towns and wide stretches of country without state or federal assistance.

The greatest danger at present is that health departments may attempt to live on their reputation for sanitation and be content with reduction of infant mortality by "tried" methods, rather than extend

exploration to other fields and attempt to convince communities of the need for broader public health measures.

The condition of mother and child immediately after birth depends largely upon prenatal and intranatal conditions. Thorough care of the new-born as to feeding, prevention of infections, etc., is necessary. Breast feeding is very important, especially in the early weeks, and cannot be stressed too strongly. Follow-up in the homes by competent nurses, after mothers have left the hospital, is most important. This can be accomplished best and most reasonably by well trained public health nurses. As a matter of fact the public health nurse is really the key to child hygiene. As health educator, home visitor, follow-up worker, she is in a strategic position. It should be understood clearly that not only the prevention of mortality among mothers and babies interests us, but also the morbidity—the damage which they suffer as a result of childbirth. The prevention of ophthalmia neonatorum is an excellent illustration of what can be accomplished by central public health authority backed by reasonable laws.

The technics of infant care after 1 month of age and through the first year of life are fairly well defined. They consist essentially in periodic examination by the physician, careful direction of feeding and hygiene, and prevention of infection. These measures may be employed in infant welfare centers or by a private physician in his own office. In a number of large cities, from 50 to 70 per cent of the babies now reach the hands of physicians for preventive care.

While in theory it is admirable to "consider every physician's office a health center," in practice it is impossible to establish such an attitude on the part of many parents. Most physicians are not equipped to attract and handle a large number of babies in their private practice. Furthermore, parents of the lower and middle economic classes cannot afford such service for well babies. It is essentially a function of the local health authorities to provide for the examination and hygienic supervision of *well* babies. This is done best through infant welfare centers as a part of community health centers. It will always be possible to secure the services of young physicians, well trained in pediatrics, to attend such centers. These physicians should, of course, be paid for each clinic hour in attendance. The sick babies should be referred to private physicians, or to babies' dispensaries or hospitals when the parents cannot afford to pay. Experience has demonstrated that this type of service has increased rather than diminished preventive pediatrics in private practice.

At present a certain amount of lag in our infant welfare program is due to the reactionary tendency of some physicians to look upon the

health care of young children as their private prerogative and to discourage the growth of local health centers. As only the well-to-do and better-off of the middle class can really afford to pay for systematic care of well babies, it is in the interest of community welfare to see that careful examination and hygienic regimen are available for all babies, either at the hands of the family physician or in health centers.

While a great deal has been done to encourage vaccination and toxin-antitoxin immunization, more is required, especially in the first year of life. There is a tendency, even among some physicians, to defer vaccination and diphtheria immunization. These measures should be offered in infant welfare centers as part of the general preventive work, until private physicians make more adequate provisions for them.

While protection against measles by use of convalescent serum or adult blood has not been widely practised, in New York City and elsewhere it has been thoroughly demonstrated that it is practical for a local health department to collect such blood and make it available to practising physicians. Similar provisions should be made for the collection and preservation of immune poliomyelitis serum.

To sum up: The practical application of community child hygiene measures may be effected:

I. *For the Infant before Birth* by:

1. Parental and pre-parental education, carried on through the public schools and extension divisions of universities, and by the local health authorities
2. Encouraging expectant mothers to place themselves early in the care of a competent physician and nurse
3. Systematic follow-up on the part of public health nurses
4. Some practical means of savings or maternity benefit
5. Protection of mother against infectious diseases and provision of adequate nutrition
6. Freedom from industrial stresses and strains, especially during the latter months of pregnancy

II. *During Birth*—the safety of both mother and child is almost entirely in the hands of the physician and nurse and depends largely upon:

1. Better obstetric training for both physicians and nurses
2. Competent nursing before, during, and after birth
3. Hospitalization of obstetric cases under suitable safeguards
4. Discouraging of bizarre or hurried obstetric practice
5. More complete reports on maternal mortality, stillbirths, and neonatal deaths with a thorough investigation of each case

III. *After Birth*—the immediate results are largely in the hands of the physician and nurse, but depend upon good prenatal and obstetric care. There should be:

1. Prompt notification and registration of births
2. Follow-up of all births by public health nurses
3. Regular, systematic examination of all well babies, and supervision as to hygiene and preventive pediatrics
4. Prevention of communicable diseases by immunization where possible

Practical application of child hygiene depends upon preventive obstetrics and pediatrics, the organization of local health centers, and thorough follow-up by public health nurses.

Dental Decay and School Work

A STUDY of over 19,000 elementary school children was recently made in Magdeburg, Germany, for the purpose of ascertaining the relation between dental decay and poor school work. Only cases of decay of both the permanent and the milk teeth were considered. Of the 19,000 children nearly 1,200 were retarded.

It was found that dental decay as defined above was 11.5 per cent more frequent among the retarded children than among those who were regularly promoted. More than one-half of the retarded children with dental decay belonged to the poorer families, such as low paid clerks, laborers, and widows without means. Somewhat similar data were obtained in other studies. It was also found that 68 per cent of the retarded children in the present study had had rickets in their early childhood, while other investigations of school children in general showed a percentage of rickets varying from 21 to 45.

The investigator came to the conclusion that hygienic and economic conditions of the child's environment and also rickets are the cause of the higher rate of dental decay among the retarded children; also that extensive dental decay often impairs the child's nutrition and results in poor school work, and rachitic children are more likely to be thus affected than those free from rickets.—*Gesundheitsfürsorge für das Kindesalter*, Berlin, 6, 1: 1-28, 1931.

The Community Health Program as It Applies to the Child of from One to Six Years*

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COMMENDABLE, indeed, and in keeping with the progress of the day, is the increasing appreciation of the significance and importance of adequate programs for child health conservation. It has been well said that a community's child health program is an index of its intelligence. There is an increasing realization of the fact that the nation's greatest asset is the health of its children. This viewpoint is not a new one. It contrasts with the days of ancient Greece and Rome only because in those days it was frequently left to the judgment of the State whether a child might be permitted to live, whereas today our child health program gives evidence of the community's interest in the principle that every child has a right to be born well.

We know much about the prevention of disease and the promotion of health among the young and yet, unfortunately, necessary expenditures for the development of adequate programs for life extension in this group are not being provided. Many supposedly intelligent communities still exhibit an unmindfulness of Dr. Dublin's emphasis on our true wealth measured in terms of the earning power of our human resources. One would hesitate, and almost question the need of emphasizing the value and significance of child health programs to a group of public health workers, were it not for the absence of the same from many communities.

Dr. Bolt has presented his views on the infant before, during and after birth. His emphasis on the relative values of prenatal services, adequate care at childbirth and during the first year of life, is of exceeding importance to the well-being of the child of from 1 to 6 years of age. He has very properly stressed the significance and importance of periodic medical supervision during the first year of life. It is, of course, fitting at this time to make mention of the value and impor-

* Read before the Child Hygiene Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

tance of the continuance of this routine medical supervision for the child of from 1 to 6. It is perhaps pertinent to establish a minimum standard for such examinations of at least once every 6 months, if more frequent ones are impractical or impossible.

It is quite generally agreed that the preschool age child, of whom there are about 12 million in the United States, furnishes a most excellent opportunity for intensive health effort. Everyone charged with the responsibility for the development of community health service should exhibit a mindfulness of the possibilities that exist in this age group for future good health—physical, as well as mental. This has been aptly called the “plastic” age and, unfortunately from the viewpoint of general accomplishment, the neglected age. Mothers who have rather frequently brought their babies to child health clinics periodically appear to have presumed that after these youngsters have arrived at the age of 1 year there would be no further need for medical supervision, and have abruptly ceased to bring them to either doctor or clinic. It is this attitude by parents, in view of our knowledge and experience, that justifies the correct presumption that this is, indeed, the “neglected” age.

MORBIDITY AND MORTALITY IN THE PRESCHOOL AGE

The general susceptibility of this group to disease and its unpleasant results call for the exercise of all well known measures for the control of these conditions. We are fundamentally aware of the exposure and susceptibility of this group to communicable diseases, and this immediately suggests the importance of organization on a basis to assure a maximum of possible prevention, as well as control, both through the instrumentality of immunization as well as of isolation. We are informed that four-fifths of all of the deaths which occur from contagious diseases are in children under 5, and also that of all deaths in all age groups from all causes 25 per cent occur in children under 5. This is a challenge to the imaginations and consciences of all intelligent health officers and calls for a program for the prevention and control of these diseases among the young.

PHYSICAL DEFECTS FOUND IN PRESCHOOL CHILDREN

Examinations of preschool age youngsters upon entering school have revealed a high percentage of physical defects, among the most prevalent being defective teeth, enlarged or diseased tonsils and adenoids, defective breathing, defective vision, defective hearing, nervous defects, and undernourishment. It requires no stretch of the imagination to appreciate these visible handicaps of children just entering

school and faced with the problems of school life. It seems self-evident that a program for the periodic physical examination of preschool age children for the purpose of keeping well children well, as well as the ascertainment of existing physical defects and the eradication of the same, is exceedingly necessary and important before this child is sent to school.

A PRACTICAL HEALTH PROGRAM FOR THE PRESCHOOL AGE CHILD

What are the possibilities and how practically possible is a sound program for this group? It is, of course, easy theoretically to visualize a program for health conservation in any age group, of setting maximum standards and including in a scope of activities all of the public health services which appear to be important. We frequently, however, find this extreme not only impractical but more frequently impossible. It is the middle of the road which we must seek, and justify only the most important and necessary of services.

While we recognize the true value and importance of habit forming clinics and their significant value in this age group, we may, except in the rare instances of communities rich in appreciation of the significance in value of mental hygiene, be content with the type of mental hygiene which may be furnished by the intelligent nurse and the physician of vision, perhaps, wherever possible, guided by the trained mental hygienist.

While we know the importance of proper posture we may find it impractical to spend much money in some communities for posture clinics.

NECESSARY FUNCTIONS

What services would appear essential in a community program for the child of from 1 to 6? All public health workers grasp the full significance of value and importance of periodic medical supervision of the apparently well child. This examination serves both its primary purpose of keeping the well child well, and that of determining its physical defects and needs.

The organization of the well baby clinic is one with which you are all familiar. The place of the public health nurse who is the bridge between the home and the clinic is well recognized. Much of the child's health progress, both physical and mental, is dependent upon the intelligence and vigilance of the nurse, who can play so important a part as health educator of the family.

Opportunities for the development of proper nutrition and health habits among this group are enormous and exceedingly important for

future good health. Diet and health are intimately related and no age group furnishes so excellent an opportunity for the development of proper dietary habits and values. Faulty food habits furnish one of the perplexing problems in the field of habit formation.

Dr. Gesell informs us that the rate of mental growth in infants is indeed very rapid, and stresses the value and significance of bringing mental hygiene within the scope of the infant and child health conference. Dr. Adler informs us that habits and traits, and character itself, are formulated before the age of 5. It is difficult for every community to set up expensive mental hygiene and habit forming clinics. It is to the intelligent conference physician and equally intelligent public health nurse that communities must look for practical solutions in the fundamental principles of mental hygiene.

We hear much about dental health. We are quite reliably informed of the relativity of the temporary teeth as a guide to the proper development and occlusion of the permanent teeth. Certainly, dental prophylactic habits acquired during early child life will remain through adolescence and adult life. This emphasizes the significance and obligation for the development of dental clinics for the young.

Studies of body mechanics by the Children's Bureau have led to the definite conclusion that proper posture is an important factor in health and that the early training of body mechanics is of significant value. I am mindful again of the difficulty many health officers will have in their endeavors to justify posture clinics for the young, and yet any attempt to outline a community program for this age group must at least allude to the relative importance of posture to health. Here again the well trained nurse may do much.

One must not lose sight of the relation of the day nursery to public health and the need for medical supervision of this group of children intrusted to the care of this type of institution. I desire only to stress at this time the importance of the adequate supervision of the physical plants themselves and the opportunity provided for medical supervision.

It is important to remember that a child has a right to play. It is a natural reaction of childhood. Nature has very satisfactorily provided that there shall be an outlet for a growing child's energy, and at the same time assists in the development of mind and muscle. Particularly today our urban life, with the hazards of the street, calls for consideration for the development of recreational facilities as a part of the community health plan. I realize that one may question the responsibility of health departments for the development of recreational facilities, but one will less seriously question the use of the influence of

the intelligent health officer in the direction of the development of this very necessary community service.

We are familiar with the possibilities for the prevention of small-pox and diphtheria. One who is familiar with the progress of medicine has a reasonable right to presume that within not too long a period science will contribute much to the knowledge of the prevention of many other diseases which now appear only in a measure conquered. As science contributes to this knowledge, so will intelligent health officers avail themselves of this and regard it as part of the justifiable programs.

THE FAMILY PHYSICIAN AND PUBLIC HEALTH

No intelligent health officer fails to exercise a true mindfulness of the very significant and important part which the private practitioner—the family doctor—can and should play in the prevention of disease and the promotion of health. While the health officer cannot logically exclude from clinics supported by taxation the child of the taxpayer, he will however morally support, and will lend his material aid to a campaign for the education of the community in regard to the ability of the family physician to participate in the promotion of the public health.

CONCLUSION

May I present briefly the summary of what I would regard as a program for community health for the child of from 1 to 6, applicable to varying communities, rural or urban, leaving to others charged with the responsibility for planning, to determine as to size of area, pooling of resources, etc.?

1. The primary requisite is well qualified medical direction, whether it be the private practitioner or the pediatrician functioning in the clinic.

2. Second only to the well qualified physician is the well trained nurse fundamentally grounded in public health and sufficiently interested to perfect herself in the fundamentals of mental hygiene, posture, and other public health activities of merit. Both the physician and the nurse must play the all important part of creating a sufficient interest in the minds of the parent as to the possibilities for child health conservation.

3. Nutrition, mental hygiene and posture shall be sufficiently considered, limited in their scope only by the amount of money available for this service.

4. The significance of dental prophylaxis should be recognized by the development of facilities for not only the school child but for the preschool age youngster.

5. Allusion has already been made to recreation, supervision of day nurseries, etc. I allude at this time to tuberculosis prevention, not because of the failure to grasp its relative significance and needs, but rather because I should prefer to re-

gard it as a condition preventable through sufficient emphasis on diet, nutrition, health education, isolation, etc., as factors playing a part in the prevention of this disease.

6. Control of communicable disease by immunization, quarantine, isolation, etc.
7. Facilities for correction of defects.

It is difficult to find the yardstick with which to measure the completeness of your program. The breadth of your vision, the resources of your community—the intelligence of the people you serve, will be, I am sure, the index of your efforts. I am mindful, indeed, of your own personal interest and willingness at all times to do everything possible for the realization of this most commendable purpose and ideal, the promotion of health and prevention of disease in children.

Aeroplane Sewage Disposal

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I HAVE recently undertaken an aeroplane trip of approximately 2,000 miles. A toilet was available in the planes, for the use of the passengers, which consisted of a modern and comfortable seat, over a lower opening of about 6 inches in diameter which led to the great open space between the plane and the earth below. There was also a washbowl in one corner from which a drain pipe emptied into the side of the toilet bowl.

Railroads contaminate the soil notoriously over a definite course which is taken into consideration when planning the water supplies for villages and cities. Aeroplane traffic may contaminate any region, any water supply, and indeed any reservoir, in view of this promiscuous distribution of human excreta.

It seems urgent that public health authorities take immediate action to eradicate this menace to pure water supplies over our entire country. I have observed a detachable vessel to receive human excreta in British passenger planes, and corresponding or equivalent precaution should be practised by American aeroplane companies.

The Community Health Program as It Applies to the Child from Six Years to Adolescence*

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WE are discussing the child as a whole in relation to the social group and not merely as a little organism with enlarged tonsils, carious teeth, faulty health habits, or unfortunate health attitudes. I hope we can add to this wholesome recognition of the individual a more vivid realization of the fact that our health programs must fit the child's needs and capabilities rather than have the child fit our programs.

I should like to direct attention to the present conception of a community health program, but particularly to a consideration of how a child from 6 years of age to adolescence can secure the essential health services that will enable him to develop to his highest potentiality both mentally and physically.

It may clarify our discussion if we review very briefly the evolution of what we are pleased to call a community health program. At present this term has a varied interpretation. The services it includes have been developed from differing points of view and by numerous specialized groups. This method of development of our social service institutions is inherent in the American scheme of things. It has both advantages and disadvantages. Notwithstanding the complexity of the development of the parts of the health program there is beginning to emerge a unified conception of what is essential to a well rounded community health program. A large share of the credit for the hastening of this has been due to the work of the Committee on Administrative Practice through the development and use of the *Appraisal Forms*.

A bird's eye view of the present status of our community health program can be secured through a brief discussion of 3 important

* Read before the Child Hygiene Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

phases of the American public health movement—these have been described as the sanitary, bacteriological, and personal hygiene phases.

The early stages of the sanitary phase^{*} was marked by a reign of terror caused by various epidemic diseases. With these epidemics attributed to all sorts of strange influences the methods of control were necessarily weird and ineffective. As our knowledge of the true causes of disease increased, the control of the environment scientifically yielded some of our most dramatic and effective solutions of public health problems, until today it is taken for granted that every community will see to it that all its members can be assured of pure water, safe milk, wholesome food supply and a freedom from nuisances detrimental to the public health. The danger in the taken-for-granted attitude is that some of these essential services may be neglected for some of our newer and more interesting procedures.

The growth of the science of bacteriology and its application to the control of disease marked another important phase of the health program. The discovery of the exact causes of some of our fatal maladies among living organisms opened up new possibilities of disease prevention. A gradually lengthening list of diseases has been placed in the communicable column. The laboratory has devised for us an increasing number of vaccines and serums—effective for the prevention and cure of specific sicknesses. Out of these researches have grown some of our most effective specialized campaigns against particular maladies, such as tuberculosis and venereal diseases. We have gradually developed an effective set of procedures for the control of communicable diseases; so our mythical 6 year old has a right to expect adequate protection both in the school and in the community.

Brilliant as have been the triumphs of the microbe hunters, their work has led inevitably to the last, the personal hygiene phase of the health program. This has been characterized by the turning of our attention more and more toward the individual. This change of emphasis has been brought about by the realization that further progress in disease control was dependent upon the education and the co-operation of the individual. More important still has been the increasing interest in health promotion as a part of the health program.

This period of our development has witnessed a broadening of the scope of the health program. Instead of depending entirely on the health official, we have had the extension of health work into the schools, the organization of numerous voluntary associations, and the establishment of foundations. Official and voluntary agencies have promoted maternal and infant welfare work, medical supervision of school children, public health nursing, mental hygiene and social hy-

giene. Most of these services have grown out of the special interests of small groups of people in a particular health problem.

The method of their development has frequently resulted in misunderstanding, and at times in conflict. Nevertheless we have now arrived at a period where we have available a well organized body of knowledge in each of these specialized fields, and of equal importance. We have well tested technics for the application of this knowledge. The major problem which remains is the integration of these specialized services into a well unified whole—a real community health program. It is the particular part of such a program as it applies to the child from 6 years until adolescence that we wish to discuss.

Fortunately for the child of school age, an adequate school health program is coming to be considered an essential part of a modern educational system. This is only just, when we consider that approximately one-seventh of our population is in this age group. Neither the child nor his parents have any choice as to where he shall spend this very sensitive and plastic period of his life. It is gratifying that such a large number of educators are translating the announced health as an objective of education into a functioning health program in the schools.

Our present health program in the schools has come down through a number of stages and from a variety of sources. A brief mention of some of the more important of these will serve to recall the explanation of the rather diverse and sometimes discrete health activities in the schools. The story of the evolution of these is interesting. One might begin a description at any one of a number of points. We will select the entrance of the physician into the schoolroom. He was called in as an emergency measure to try to stop an epidemic disease. Once inside the schools, he remained to discover that large numbers of the supposedly normal children had physical defects which were handicapping them both mentally and physically. While seeking to assist in solving these problems, the trained school physician has moved toward the still more important field of health promotion. Important as the work of the physician is in the schools, medical inspection alone does not constitute a health program, for you cannot inspect children into health.

Health instruction in the schools has had an interesting history. It originated as part of the effort of an interested group in fighting the use of alcohol and tobacco. In many states physiology and hygiene became required subjects. This led to a form of mechanized teaching that has been aptly called "blood and bone physiology," but with the birth of the modern health education movement, health instruction has

taken its place as one of the fundamentals of any well rounded health program, though all of us are convinced that you cannot instruct the child into health.

Our picture would be incomplete without a mention of the growth and development of physical education in its health aspects. We are all familiar with the early efforts to improve health by means of formal exercises. Then came the gradual development of a more modern plan with all of its important contributions to the improving of the functioning of both body and mind. No school could be considered as having a well rounded health program without physical education. We are sure, however, that it is not impossible to exercise children into health.

From these three main sources have arisen the widely diversified and frequently unrelated health activities in our school systems. A recent study of the character, scope and results of the school health program in representative cities in various parts of the United States has shown that there is neither uniformity nor unity in methods or administration.

Notwithstanding the wide diversity both of origin and method of health activities there has come to be a well defined opinion as to the minimum essentials we have a right to expect to be made available in every community for the child of school age. These essentials may be classified as: health instruction and training; medical supervision; hygiene of the school program; and hygiene of the school plant.

Health instruction and training are now taking their proper place in the regular curriculum of the school. We no longer expect the classroom teacher to be able to teach hygiene without special preparation. If the school health program is a good one, we will find a well planned program of training in health habits in the lower grades. As the child advances, health knowledge will be added. All of this, under skilled teaching methods, tends to the formation of ideals and attitudes that will tend to promote health.

Medical supervision of children and teachers is now recognized as an essential of every health program. If the obligation to safeguard the health of the child is to be met, it is no longer sufficient to call in the neighborhood physician on part time or in emergencies. The job of medical inspector requires special training and experience. Further, the work of the physician must be supplemented by sufficient trained and experienced public health nurses. This group of trained people will make available a system of health inspections for the control of communicable diseases. In addition, periodic health examinations of proper thoroughness will furnish a basis for the correction of

defects and an individual hygiene program adapted to the needs of the child.

The hygiene of the school program has an important bearing upon the levels of health attained by the child. Wise school administrators give careful thought to the length and arrangement of the program. The skillful use of rest periods and recesses goes toward permitting the child to make a successful hygienic adjustment to the school environment. It is fair for us to expect the health of the child to be improved rather than injured during his elementary school experience.

Finally, the hygiene of the school plant is one of the fundamentals of the health maintenance of the child. We have a responsibility to challenge the right of the state to compel the child to attend school in an improperly constructed, poorly lighted or inadequately ventilated building. Further, there is no possible excuse for the absence of proper sanitary equipment, including ample facilities for handwashing. All too frequently an excellent school plant is placed in charge of an unskilled, politically appointed, underpaid janitor. We should have janitors whose training and experience include the fundamentals of sanitary engineering.

These, in briefest outline, are the essentials of a health program in the schools for the child from 6 years to adolescence. We are all aware that some schools have parts of this program highly developed. Few have all of them functioning as a whole. This is a problem of administration. It means the placing of the health program in charge of a properly qualified person who has both the authority and the skill to weld the diverse interests and activities into a unit for the service of the child.

In conclusion, we seem justified in saying that the community health leaders should recognize the important claims of the child of school age for a high quality of health protection from the hazards of communicable diseases, impure water, contaminated milk, or unwholesome foods.

To the educators we can state that they have both a privilege and responsibility to assure this child a well rounded health program including all of the essentials which have now proved their value by the test of use.

To all of the health workers concerned with children we can appeal to participate heartily and unselfishly in the effort to integrate the diversified health activities into a unified program the sole purpose of which will be the service of the child in the effective way.

Present Status of *Acidophilus* Milk*

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ACIDOPHILUS milk continues to attract wide attention. Physicians are increasingly interested. Patients, suffering from widely differing complaints and in various stages of ill health, seek its aid.

On the other hand, the process of manufacturing acidophilus products is a difficult matter. A satisfactory product must contain an enormous number of living lactobacilli in such a vital condition that they will maintain their viability in sufficient numbers until the product is used. This apparently means that fresh strains must be isolated frequently, or at least they must be tested for their ability to implant themselves in the human intestine; and only effective strains must be put upon the market.

The possible value of sour milk as an article of diet was suggested and rationalized by Elie Metchnikoff. He studied and recommended for use a milk fermented by *B. bulgaricus*, which is still widely used in European and Asiatic countries. In America, a closely related organism has been generally recognized as possessing superior merits, and this has almost entirely taken the place of the Bulgarian bacillus.

In 1900, Ernst Moro,¹ a German investigator, found a distinctive, Gram-positive bacillus to be the predominant organism in the intestinal tract of milk-fed babies. Within the next few years his work was confirmed, the bacillus accurately described and named *B. acidophilus*. Quite recently, this germ, with its near relatives, has been transferred to a new genus by Miss Holland, and it is now known as *Lactobacillus acidophilus* (Moro) Holland.

In 1911, Rotch and Kendall² and in 1915, Rettger and his associates suggested the idea and presented evidence³ that this organism might be advantageously used instead of *B. bulgaricus*.

Since 1914, about 10 articles have appeared each year, and, in ad-

* Read before the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 28, 1930.

dition, two books dealing exclusively with *L. acidophilus* and its applications have been published.

The authors, in view of a somewhat extended research project, have attempted to acquaint themselves at first hand with the literature on this subject. In doing this, they have consulted 182 communications which deal either with *L. acidophilus* directly, or with the intestinal flora of man and experimental animals.

One of the problems which has interested investigators since the earliest days of bacteriology has been the germ content of the intestinal tract and, especially more recently, the possibility of modifying it by change of diet. We have found 66 papers dealing with this phase of the subject. It seems fair to summarize them by saying that when an infant is born its intestinal tract is sterile, but almost immediately bacteria enter, not only through food and other contacts of the mouth, but through the anus.

If the child is breast-fed, its early heterogeneous flora soon settles down to one that is predominated by an anaerobic relative of *L. acidophilus*, now called *Bacteroides bifidus*. In bottle-fed infants, the characteristic organism is *L. acidophilus*. As soon as children become accustomed to a mixed diet, their intestinal flora comes to resemble more and more that of adults. This adult flora, most authors agree, is made up of very few Gram-positive rods, and is rather of the enterococcus and colon bacillus type. This is regarded as normal. The intestinal flora of certain individuals, especially meat eaters, is of the putrefactive type and is regarded as abnormal and very undesirable.

A few adults have what is regarded as the most desirable type, the *L. acidophilus* flora of children, or the fermentative type. The common opinion of those who have investigated the matter is that the type of intestinal flora may be modified by changes in diet, and that the fermentative type may be stimulated by consuming liberal quantities of milk and certain supplemental carbohydrates, such as lactose and dextrin. These, in part at least, pass through the small intestine unabsorbed, ready to stimulate the growth of *L. acidophilus* in the colon if this organism should be present. However, it seems clear that diet alone cannot be depended upon to establish a fermentative type of flora except in rare cases.

Another problem has attracted attention: the possibility of implanting *L. acidophilus* in the intestinal tract by the use of massive doses of this organism with an ordinary diet or in connection with certain supplemental foods. We have found 18 articles on this subject, including one book,⁴ which not only presents a great array of facts; but also carefully reviews the previous literature.

In 1926, Kopeloff's⁵ excellent book on *L. acidophilus* appeared. In this the later contributions are discussed, and new material is presented. Since then, other articles have appeared. All of this literature is quite unanimous in maintaining the thesis that massive doses of the organism taken regularly over a period of days or weeks, especially with milk or certain carbohydrates, almost invariably establish *L. acidophilus* as a predominant intestinal organism, frequently to the practical exclusion of other forms.

Milk cultures probably offer the best means of supplying effective doses, but for various reasons milk concentrates, or *L. acidophilus* in mediums other than milk, are desiderata. Several have been proposed, and some at least are promising, but up to the present time scientific literature discussing their value is lacking.

The most essential question is: When implantation has been accomplished, will beneficial clinical results follow? We find that there are about 40 articles dealing specifically with this subhead, and a number of others indirectly.

Most of these deal with the treatment of chronic constipation. The results reported, with perhaps a single exception, have been highly satisfactory. Bassler and Lutz (1922)⁶ maintain that the therapeutic value of *L. acidophilus* has been over-rated, and that benefits claimed are derived from a change in the reaction of the intestinal contents, due to the diet rather than to the presence of any organism. Their data are hardly detailed enough to be convincing. It is contrary to that of all other workers and should not be taken too seriously, since Kopeloff (1923)⁷ and Kopeloff and Beerman (1923)⁸ have quite clearly demonstrated that favorable clinical results are obtained only when fermented milk contains living organisms. The small proportion of unsatisfactory results reported may have been due to failure to secure implantation through lack of sufficient doses, or some other undetermined cause such as lack of supplemental carbohydrates. A 60 to 70 per cent change to the *L. acidophilus* type in the intestinal tract relieves constipation, and in many cases the benefits persist beyond the continuation of the culture or the carbohydrates. However, there seems to be some correlation between the permanence of the benefits and the length of time that *L. acidophilus* is recoverable from the stools. Some encouraging results have been obtained in the treatment of diarrhea and other intestinal infections.

There is still some confusion about the relation between *L. acidophilus* and its close relatives. The first American paper on this group was that of Kendall (1910).⁹ He suggested the term aciduric as better than acidophilic, claiming that the organisms "endure" rather

than "love" acid. The generic name of *Lactobacillus*, proposed by Beijerinck (1901), has recently been officially adopted. Under this genus, Bergey¹⁰ lists 35 species. There are two different types that need special mention in this connection: *L. bulgaricus* and *L. odontolyticus*.

L. bulgaricus is closely related to *L. acidophilus*, but gradually certain differences are being generally recognized. One is the action on maltose. Another was suggested by Albus and Holm (1925 and 1926).¹¹ They claim that the growth of *L. bulgaricus* is inhibited by a surface tension below 40 dynes, while *L. acidophilus* grows well in the same medium depressed as far as 36 dynes. These findings have been corroborated by Kopeloff and Beerman¹² in three papers (1926 and 1927). However, Day and Gibbs (1928)¹³ arrived at quite different conclusions. They found that any differences in the growth of the two organisms are not due directly to surface tension, but rather to the toxic action of the depressants, and are not sufficiently marked to be of service in differentiating the organisms.

On the other hand, attempts to implant *L. bulgaricus* in the human intestine have almost always failed, while *L. acidophilus* is almost always reported as readily implantable. This should be expected, since it is quite generally recognized that the natural habitat of *L. acidophilus* is in the intestinal tract, while that of *L. bulgaricus* is in some outside environment, such as milk.

L. acidophilus is regarded by some authors as the cause of dental caries. This is not only because this organism is frequently found in the presence of decaying teeth, but also because experiments have indicated that dental caries may be produced *in vitro* by *L. acidophilus*; yet, careful studies by those well acquainted with *L. acidophilus* seem to show that the organism associated with dental caries may be quite definitely differentiated from *L. acidophilus*. Considerable evidence by competent investigators indicates that this should be regarded as a distinct species, for which the name of *L. odontolyticus* has been used.

The success and popularity of *L. acidophilus* therapy have led to the manufacture of a great many products containing the organism. The most universally accepted product, of course, is milk. Whey and fruit juice, carriers of the organism, undoubtedly are of value, but as yet are not widely used.

A number of attempts have been made to concentrate the bacillus into a product of dry or semidry nature. On the whole, these have not been successful. Rettger has stated that an acidophilus concentrate that combines the salient features of acidophilus milk would be a welcome substitute.

Finally, it is quite apparent that an acidophilus product of the highest quality is one in which an enormous number of *L. acidophilus* are present; these organisms must be viable at the time of consumption; and the strain must be one that is known to be readily implantable.

REFERENCES

1. Moro, E. Ueber den *B. Acidophilus* in N. Sp., *Jahrb. f. Kinderh.*, 52: 38-55, 1900.
2. Rotch, T. M., and Kendall, A. J. A Preparatory Study of the *Bacillus Acidophilus* in Regard to Its Possible Therapeutic Use, *Am. J. Dis. Child.*, 7: 30-38, 1911.
3. Rettger, L. F., and Cheplin, H. A. Therapeutic Application of *Bacillus Acidophilus*, *Proc. Soc. Exper. Biol. & Med.*, 19: 72-76, 1921.
4. Rettger, L. F., and Cheplin, H. A. *Treatise on the Transformation of the Intestinal Flora with Special Reference to the Implantation of Bacillus Acidophilus*, Yale University Press, 1921, 135 pp.
5. Kopeloff, N. *Lactobacillus Acidophilus*, Williams & Wilkins, Baltimore, Md., 1926.
6. Bassler, J., and Lutz, J. R. *Bacillus Acidophilus*: Its Very Limited Value in Intestinal Disorders, *J. A. M. A.*, 79: 607-608, 1922.
7. Kopeloff, N. Is the Action of *Bacillus Acidophilus* a Strictly Bacteriologic Phenomenon?, *J. A. M. A.*, 80: 602-604, 1923.
8. Is *Bacillus Acidophilus* Therapy a Strictly Bacteriological Phenomenon?, *Proc. Soc. Exper. Biol. & Med.*, 20: 123-124, 1923.
9. Kopeloff, N., and Beerman, P. *Bacillus Acidophilus* Therapy, *Sci. Proc. Soc. Am. Bact.*, pp. 28-30, Dec., 1922. (*Abs. Bact.*, 7: 66, 1923.)
10. Kendall, A. J. Observations on Aciduric (Acidophilic) Bacteria, *J. Med. Res.*, 22: 153-167, 1910.
11. Bergey, D. H. *Manual of Determinative Bacteriology*, 1930.
12. Albus, W. R., and Holm, G. E. The Effect of Surface Tension on the Growth of *Lactobacillus Bulgaricus* and *Lactobacillus Acidophilus*, *Proc. Soc. Exper. Biol. & Med.*, 22: 337-338, 1925.
13. Surface Tension as a Factor in the Growth of *Lactobacillus Acidophilus* and *Lactobacillus Bulgaricus*, *Sci. Proc. Soc. Am. Bact.* (Washington Branch), Feb., 1924.
14. Effect of Surface Tension upon Growth of *Lactobacillus Acidophilus* and *Lactobacillus Bulgaricus*, *J. Bact.*, 12: 13-18, 1926.
15. Kopeloff, N., and Beerman, P. *L. Acidophilus* and *L. Bulgaricus* as Influenced by Surface Tension, *Proc. Soc. Exper. Biol. & Med.*, 23: 544, 1926.
16. Surface Tension Studies with *L. Acidophilus* and *L. Bulgaricus*, *J. Bact.*, 13 (1), 1927.
17. Surface Tension Studies, *J. Infect. Dis.*, 40: 656-666; and *Psychiat. Quart.*, 1: 357-369, 1927.
18. Day, A. A., and Gibbs, W. M. Surface Tension in Relation to Bacterial Growth, *J. Infect. Dis.*, 43: 97-107, 1928.

Sunshine in the Laundry Bundle

PUBLIC health is being more and more prostituted by the advertisers who reach absurdities which scientific men would never suspect.

"... Now comes a laundry in the city of Chicago which promises healthful cleanliness to every home through the application of ultra-violet and ozone to linens, towels, sheets and pillow cases. The slogan is 'Year 'Round Sunshine with Fresh Mountain Air.' Apparently the application of ultra-violet rays and ozone confers longer wear on the sheets and pillow cases which are 'sun-drenched with such healthful cleanliness.' Moreover, the advertiser asserts, 'You'll like the friendly feel you'll get between fresh, crisply clean, sunsweet sheets at bedtime.' One is tempted to cogitate as to whether or not such nocturnal enjoyment might not lead to insomnia. Perhaps the Ideal Wet Wash Laundry which 'puts sunshine in the laundry bundle when it rains' will make scientific studies necessary to establish the truth or falsity of this theory."—*J. A. M. A.*, May 2, 1931, p. 1508.

Transformation of the Intestinal Flora through the Feeding of Unfermented *Acidophilus* Milk*

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TO some who would like to take advantage of acidophilus therapy, the ordinary cultured acidophilus milk is distasteful. In view of this and also because the lactic acid in a fermented milk has been shown to have little or no value in bringing about a transformation of the intestinal flora (Kopeloff¹), it was thought that a milk product which has the taste of ordinary sweet milk and yet is a means for carrying large numbers of *L. acidophilus* into the intestinal tract would meet a real need. Such a product has been developed and for lack of a better name has been termed unfermented acidophilus milk. This product has suspended in it a high concentration of viable *L. acidophilus*; yet has the taste and physical properties of a rich whole milk. The concentration of viable *L. acidophilus* is similar to that obtained in a good cultured acidophilus milk which usually has from 100 to 600 million *L. acidophilus* per c.c. as determined by the plate method.

Unfermented acidophilus milk is handled in the same manner as market milk and is manufactured for immediate consumption, although it is stable enough to be kept in good condition for several days. Since growth of *L. acidophilus* is inhibited by a temperature of 18°–20° C., the development of acid is almost entirely prevented by keeping the milk at a temperature below 10° C. Storing the milk at 2°–5° C. makes it possible to keep it sweet for as long as 7 days.

Because sweet milk is a more favorable medium for maintaining the viability of *L. acidophilus*, unfermented acidophilus milk does not decrease in count so rapidly as the sour acidophilus milk. Counts made after 4 or 5 days' storage in a refrigerator at about 2°–5° C. show that the death rate of *L. acidophilus* under these conditions is very low. As long as the temperature is kept sufficiently low this product is stable enough to be shipped considerable distances and kept

* Read at a Joint Session of the Public Health Engineering and Food, Drugs and Nutrition Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 30, 1930.

† In collaboration with M. E. Parker, Randall Whitaker, Ph.D., and Lillian W. Conn.

TABLE I

UNFERMENTED ACIDOPHILUS MILK
FEEDING EXPERIMENTS WITH HUMAN SUBJECTS
Group I

Subject	Fecal Analyses—Plate Method <i>L. acidophilus</i> (X-type) % of Total Count							<i>L. acidophilus</i> Average % of Total Count
	April 30	April 30	May 6	May 9	May 14	May 19	May 24	May 9-24
No. 1	0	Started on unfer- mented acidophilus milk	11	10	56	1	51	29
No. 2	0		18	—	—	80	75	78
No. 3	0		81	92	59	72	60	71
No. 4	0		75	16	41	3	77	37
No. 5	0		13	88	35	60	10	48
No. 6	0		0	99	47	81	98	81
No. 7	—		22	93	56	57	58	66

in storage for a few days without injuring the product or destroying the viability of the acidophilus organisms. As a check on this point the unfermented acidophilus milk used in Group II of the feeding experiments was consumed when it was between 2 and 6 days old; and was capable of bringing about implantation of *L. acidophilus* in the intestinal tract.

This product is not stable unless it is kept cold, and souring is rapid at room temperature, 10° C. (or 50° F.) being about the maximum at which the milk can be stored satisfactorily. The whole milk in which the *L. acidophilus* organisms are suspended is given a higher heat treatment than is ordinarily given pasteurized milk. This reduces the con-

TABLE Ia

UNFERMENTED ACIDOPHILUS MILK
FEEDING EXPERIMENTS WITH HUMAN SUBJECTS
Group I

Subject	Analyses of Feces—Plate Method <i>L. acidophilus</i> (X-type) Millions per gram Feces						
	April 30	April 30	May 6	May 9	May 14	May 19	May 24
No. 1	0	Started on unfer- mented acidophilus milk	384	80	264	0	320
No. 2	0		176	—	—	3,440	2,340
No. 3	0		336	950	340	560	330
No. 4	0		568	50	444	1	660
No. 5	0		28	1,190	1,134	60	15
No. 6	0		0	460	204	390	100
No. 7	—		720	460	2,142	130	360

TABLE II

UNFERMENTED ACIDOPHILUS MILK
FEEDING EXPERIMENTS WITH HUMAN SUBJECTS

Group II

Subject	Fecal Analyses—Plate Method <i>L. acidophilus</i> (X-type) % of Total Count								Lactic Acid Average % of Total Count
	Aug. 25	Aug. 2	Sept. 3	Sept. 4	Sept. 6	Sept. 11	Sept. 16	Sept. 23	Sept. 6-23
No. 2*	0	0	0	Started on unfermented <i>acidophilus</i> milk	98	49	71	88	77
No. 3*	0	9	0		20	59	63	82	56
No. 5*	—	—	—		—	—	80	33	57
No. 6*	0	1	0		83	46	86	100	79
No. 7*	0	0	0		75	68	85	91	80
No. 8	0	0	0		67	69	99	47	71
No. 9	0	0	0		98	29	92	93	78
No. 10	0	0	0		55	11	40	33	35
No. 11	—	—	0		92	93	99	77	90

* Subjects in Group I.

taminating organisms to a very low count. The *L. acidophilus* organisms are grown in a sterilized medium and freed from it in such a way as to avoid contamination. They are then suspended in the pasteurized milk by procedures which reduce the chances of contamination to a minimum.

After the development of the technical side of the manufacturing process, feeding experiments were conducted with white rats. The object of these was to determine if the cells of *L. acidophilus* suspended in unfermented milk are still capable of being implanted in the intestinal tract. In general, the procedures were the same as those described by Rettger and Cheplin.² Fecal samples were examined before the feeding period by plating on tomato juice peptone agar, the plates being incubated under a partial carbon dioxide atmosphere. Whey agar shake cultures were made of various dilutions of the fecal specimens instead of Veillon tubes.

In these as well as in the experiments with human subjects our chief criterion for judging whether satisfactory implantation had been obtained was the isolation from fecal plates of high dilutions of the type of *L. acidophilus* which was being fed. We consider this method the most dependable way of determining whether implantation has been accomplished. Though we tried some of the other methods—Gram stained microscopic smears and whey agar tubes—we were inclined to put much more weight on the plate method than on the others. The

results were as follows: Successful implantation was obtained in 4 white rats fed, in addition to the bread and meat diet, 5 c.c. of unfermented acidophilus milk daily. Two of these were put on a bread and meat diet at the end of the 2 weeks' feeding period. After they had been on this diet for a month, and were found to have no *L. acidophilus* in their feces, they were again fed unfermented acidophilus milk and successful implantation was obtained within a week. Two rats were fed 5 c.c. of a cultured acidophilus milk for comparison, and successful implantation was obtained also in these. These preliminary results indicated that the organisms suspended in unfermented milk were not injured in the manufacturing process and were capable of being implanted in the intestinal tract.

The next step was to determine: (1) whether the lactobacilli which were suspended in unfermented acidophilus milk can be implanted in the human intestinal tract, and (2) to what extent the human intestinal flora can be transformed to a simplified Gram positive type by the regular feeding of unfermented acidophilus milk. Two groups of experiments in which 11 individuals drank unfermented acidophilus milk for periods of 3 weeks were conducted. The first group lasted from May 6 to May 24; the second from September 4 to September 23. In the second group were included 5 individuals who were also in the first. Most drank a quart of unfermented acidophilus milk daily, though some varied from this amount and occasionally went for 2 or 3 days without. However, on the whole, the consumption of milk was regular. Each person continued on his regular diet, though some remarked that the amount of their regular diet was decreased.

TABLE IIa

UNFERMENTED ACIDOPHILUS MILK
FEEDING EXPERIMENTS WITH HUMAN SUBJECTS

Group II

Subject	Analyses of Feces—Plate Method <i>L. acidophilus</i> (X-type) Millions per gram Feces							
	Aug. 25	Aug. 29	Sept. 3	Sept. 4	Sept. 6	Sept. 11	Sept. 17	Sept. 23
No. 2*	0	0	0	Started on unfermented acidophilus milk	1,920	1,710	1,370	141
No. 3*	0	63	0		249	274	109	800
No. 5*	—	—	—		—	—	237	15
No. 6†	0	0	0		110	73	708	490
No. 7*	0	0	0		460	300	780	510
No. 8	0	0	0		189	270	297	80
No. 9	0	0	0		616	73	660	1,520
No. 10	0	0	0		54	16	87	117
No. 11	—	—	0		141	1,330	1,100	57

With the exception of No. 11, a woman, all were men. Nos. 7 and 10 were slightly under 20 years of age, No. 5 was elderly, the others were in their third decade. The subjects were healthy and normal except that a few were subject to slight constipation.

Examinations were made of fecal specimens before the subjects began drinking the unfermented milk, and thereafter every 4 or 5 days. Tomato juice peptone agar or digested milk agar plates were used in determining the number of viable cells of *L. acidophilus* per gm. of fecal material. Smears stained by Gram's method were prepared and observed but no counts were made.

Tables I and II show the percentages of acidophilus present in the feces, and in Tables Ia and IIa are recorded the *L. acidophilus* counts per gm. of fecal material. Tables III and IV give information on the unfermented acidophilus milk used.

TABLE III

UNFERMENTED ACIDOPHILUS MILK USED IN FEEDING EXPERIMENTS

Group I

Analyses made 3-5 days after
Manufacture
(Samples stored at 2°-5° C.)

Date of Manufacture 1930	pH	<i>L. acidophilus</i> Count per c.c. (Digested Milk Agar)
May 1	6.30	333,000,000
" 3	—	105,000,000
" 6	6.00	423,000,000
" 8	—	92,000,000
" 10	—	309,000,000
" 13	6.40	160,000,000
" 15	6.18	760,000,000
" 17	6.35	800,000,000
" 20	—	156,000,000
" 22	6.15	265,000,000
		Average 340,000,000

In all the experiments *L. acidophilus* of the X-type was used, though different strains were employed. These grow readily in milk, and a 2 per cent inoculation brings about curdling in from 16 to 18 hours' incubation at 37° C. They grow in digested milk at pH 8.0, and tolerate a concentration on phenol of 1:400 and a concentration of indol of 1:1,420. The colonies on tomato juice peptone agar are extremely filamentous. Culture RL8A (used in Group II of the human experiments) tends to grow slightly more compactly than the others. These cultures are Gram-positive slender rods occurring singly, in pairs and occasionally in chains of 3-4.

TABLE IV

UNFERMENTED ACIDOPHILUS MILK USED IN FEEDING EXPERIMENTS GROUP II

Average of Analyses made on 2d and 4th Days after Manufacture
(Samples stored at 2°-5° C.)

Date of Manufacture 1930	pH	<i>L. acidophilus</i> Count per c.c. (Digested Milk Agar)
Sept. 2	6.52	390,000,000
" 4	6.49	372,000,000
" 6	6.45	631,000,000
" 8	6.33	748,000,000
" 10	6.60	218,000,000
" 12	6.48	639,000,000
" 15	6.59	514,000,000
" 17	6.51	508,000,000
		Average 402,000,000

SUMMARY AND CONCLUSIONS

1. It has been shown that the cells of *L. acidophilus* which are suspended in unfermented acidophilus milk are capable of being implanted in the human intestinal tract. It appears, then, that the process of manufacture does not injure the viability of the organisms and that the most important consideration is the use of a strain of *L. acidophilus* which is adapted for growth in the intestine.

2. In the 16 experiments on human subjects, successful implantation of *L. acidophilus*, as determined by the plate method, was obtained in each case. In 12 of the 16 experiments a predominant *L. acidophilus* flora was obtained by the regular consumption of approximately 1 quart of unfermented acidophilus milk per day, no other modification of the ordinary diets of the subjects having been made.

REFERENCES

1. Kopeloff, N. *Lactobacillus Acidophilus*. Williams & Wilkins, 1926, pp. 112-116.
2. Rettger, L. F., and Cheplin, H. A. *A Treatise on the Transformation of the Intestinal Flora with Special Reference to the Implantation of Bacillus Acidophilus*. Yale University Press, 1921.

Studies on the Viability of *L. acidophilus* in "Acidophilus Milk"

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EXPONENTS of acidophilus therapy agree that, regardless of the method of administration, satisfactory therapeutic effects are dependent upon the use of cultures which contain large numbers of viable organisms. Those who have opposed the employment of broth cultures and various so-called concentrates have maintained that these preparations may fail in part because they do not preserve the viability of *L. acidophilus* for any appreciable length of time. Long experience with acidophilus milk has shown that milk constitutes a particularly favorable medium for the growth and continued viability of this organism.

It seems to be the consensus of opinion that acidophilus milk should contain at least 100 million viable organisms per c.c. when it reaches the consumer. When authentic and vigorous strains of *L. acidophilus* are employed, properly prepared acidophilus milk should contain from 500 million to 1 billion viable bacilli per c.c. at the time the product is bottled. It is essential that the producer maintain a high viability in his product in order that the consumer may secure the full therapeutic effect. When the manufacturing plant is so located that the milk can be used within 48 to 72 hours after preparation, this is relatively simple. However, under present methods of distribution a considerable quantity is from 3 days to 2 weeks old before it is used. It is imperative, therefore, that the product be of the highest purity and viability in order to meet the most rigid requirements during storage.

Commercial acidophilus products are being examined by state and federal laboratories, and it is quite possible that in the near future legislation will be enacted which will require them to meet certain standards, particularly as regards viability.

Kopeloff and Berman¹ studied the effect of storage temperature on *L. acidophilus* in milk, and claimed that there is an enormous decrease in the number of viable bacilli when acidophilus milk is stored in the refrigerator, and that this does not take place when stored at ordinary

* The greater part of the work reported in this paper was completed in the laboratories of the Yale University School of Medicine where the author was Assistant Professor of Bacteriology until July 1, 1930.

room temperature. Hence, they recommend storage at room (20–30° C.), instead of icebox, temperature. Since the commercial distribution of acidophilus milk has attained considerable proportions, it appeared advisable to make further inquiry into the question of viability of *L. acidophilus* during prolonged storage.

It is impracticable for the producer of commercial acidophilus milk to store this commodity at room temperature because (1) The commercial product is rarely pure culture. Given a small initial contamination, and high *L. acidophilus* count, storage at room temperature (above 20° C.) may cause a decided increase in the numbers of contaminating forms, with resultant damage to the milk on account of the corresponding decrease in number of viable *L. acidophilus* cells which naturally takes place, and as a rule the production of "off" flavors and odors. (2) Storage at room temperature promotes the continued action of saccharolytic enzymes, with resultant increase in acidity. Within a few days the milk may become so sour as to be unpalatable.

Since acidophilus milk does not appreciably change in acidity at temperatures below 20° C., and since lower temperatures will inhibit or at least greatly retard the growth of most contaminating forms, particularly in a medium as acid as this normally is, the writer has sought storage conditions which will conserve the maximum viability of the organism without changing to any great extent the specific characteristics of the product.

An authentic human strain of *L. acidophilus*, typical in all respects, was employed in the majority of the experiments reported, though several other strains of either human or rat origin were used in some of the comparative tests. All strains gave essentially the same general results. Typical *L. acidophilus* organisms have the following characteristics:

They are non-motile and non-sporing, Gram-positive rods which produce chiefly lactic acid in milk with traces of acetic acid, forming acid without gas in lactose, galactose, sucrose, maltose and levulose broths. The optimum temperature is 37.5° C., the minimum close to 20° C. Colony formation in special agar medium³ is commonly of the rough or X-type, as described by Rettger and Horton.⁴ Incubation in an atmosphere containing approximately 10 per cent carbon dioxide⁵ enhances the growth of most strains; CO₂ is detrimental to none, and is necessary for some. When ingested along with lactose or dextrin, they will grow in the digestive tract of man, and may be recovered from the feces.

In the present investigation the main emphasis was placed on via-

bility as affected by: (1) initial and final reaction of the product, (2) storage temperature, (3) incubation temperature, and (4) butter fat.

The quantitative determination of living *L. acidophilus* was made according to the method of the author.² Tomato agar³ was employed as the plating medium. Since the counts are very high, the error is obviously considerable and numbers are at best only relative. Accurate counts of *L. acidophilus* in milk cultures are out of the question, and differences of 10 or 15 per cent in duplicate platings are the rule rather than the exception. The acidity of the milk is expressed in percentage lactic acid as determined by titration with $n/20$ NaOH, phenolphthalein being the indicator. The number of viable *L. acidophilus* is recorded in all tables as millions.

Certain variation in counts should be discussed. In the course of many experiments the viable count determined after 1, 2, or 3 days' holding was greater than at the initiation of storage. This variation may be due to the acknowledged inaccuracy of the plating method. There also may be some multiplication during the first few hours of storage before the milk has reached the temperature of the chamber.

EXPERIMENT I

The influence of varying initial reactions upon the viability of L. acidophilus in milk culture stored at 12° C. and at room temperature, 23° C.

Eight flasks of sterilized skimmed milk were inoculated with *L. acidophilus* as follows: 2 at 8:10 A.M., 2 at 10:10 A.M., 2 at 12:10 P.M., and 2 at 2:10 P.M.; and after shaking were at once placed in a 35° C. incubator. Quantitative platings and titratable acidity determinations were made from one flask of each pair at 8:10 A.M. on the following day, after this one was stored at 12° C. and the other at 23° C. Viability and acidity were determined at stated intervals.

In this experiment (Table I) Kopeloff's claims regarding viability are supported to a certain extent. Viability of *L. acidophilus* continued higher at room temperature than at 10–12° C. during the earlier period of storage. After prolonged holding the results are reversed. However, after continued storage the acidity of the milk kept at room temperature had increased from 2 to 3 times as much as that held at 10–12° C. The initial acidity, or some metabolic product associated with the development of high acidity, plays a considerable part in determining the sustained viability during storage, which decreases at a rate somewhat proportional to the initial acidity. Rogers⁴ reported that *S. lacticus* elaborates a chemical substance which is inhibitive to itself and to *L. bulgaricus* as well. The same sort of factor may operate in the case of *L. acidophilus*.

TABLE I

SHOWING INFLUENCE OF VARYING INITIAL ACIDITIES ON VIABILITY AT DIFFERENT TEMPERATURES

Length of Storage	Storage at 12° C.			Storage at 23° C.		
	Count per c.c.	Per Cent Decrease in Count	Acidity in Per Cent	Count per c.c.	Per Cent Decrease in Count	Acidity in Per Cent
Inoculated 24 hrs. before storage						
At beginning	790		0.61	790		0.61
1 day	270	66	0.63	315	60	0.67
2 days	190	75	0.61	470	41	0.68
4 days	150	81	0.62	315	60	0.77
6 days	65	92	0.60	315	60	0.86
9 days	10	98	0.63	80	90	1.08
15 days	10	98	0.63	20	96	1.3
22 days	10	98	0.67	15	97.5	1.4
Inoculated 22 hrs. before storage						
At beginning	450		0.54			
1 day	300	33	0.53	500	none	0.61
2 days	250	44	0.52	285	37	0.67
4 days	200	55	0.54	300	33	0.77
6 days	90	80	0.53	320	30	0.91
9 days	90	80	0.54	220	50	1.26
15 days	80	82	0.60	75	80	1.57
22 days	60	86	0.60	35	95	1.65
30 days	30	94	0.63	6	99	1.65
Inoculated 20 hrs. before storage						
At beginning	280		0.46	280		0.46
1 day	270	3	0.48	400	none	0.60
2 days	185	34	0.48	380	none	0.71
4 days	225	20	0.48	320	none	0.77
6 days	200	28	0.48	250	10	0.96
9 days	125	55	0.52	170	40	1.28
15 days	115	59	0.57	70	60	1.62
22 days	65	77	0.59	40	85	1.74
30 days	40	85	0.63	5	98	1.74
Inoculated 18 hrs. before storage						
At beginning	210		0.44	210		0.44
1 day	280	none	0.42	330	none	0.59
2 days	220	none	0.40	350	none	0.67
4 days	200	5	0.43	700	none	0.80
6 days	170	20	0.43	410	none	0.99
9 days	130	37	0.49	140	35	1.31
15 days	140	35	0.52	50	76	1.68
22 days	150	33	0.59	20	90	1.87
30 days	75	65	0.57	5	97	1.85

EXPERIMENT II

The viability of L. acidophilus in milk cultures of varying initial acidity when stored at 5° C.

Three flasks of sterilized skimmed milk were inoculated with like amounts of *L. acidophilus* milk cultures at different hours during the

TABLE II

SHOWING THE EFFECT OF VARIED INITIAL ACIDITY UPON THE VIABILITY OF *L. ACIDOPHILUS* AT 50° C.

Time Inoculated.....	8 A.M.			2:30 P.M.			5:30 P.M.		
Length of Storage at 5° C.	Count per c.c.	Per Cent Decrease	Acidity in Per Cent	Count per c.c.	Per Cent Decrease	Acidity in Per Cent	Count per c.c.	Per Cent Decrease	Acidity in Per Cent
At beginning	700	—	0.9	285	—	0.5	135	—	0.37
2 days	435	40.0	0.9	285	none	0.5	125	7	0.37
8 days	35	95.0	0.9	250	12	0.5	100	26	0.37
13 days	0	99.0	0.9	130	54	0.5	115	15	0.37
17 days	0	99.5	0.9	90	70	0.5	80	40	0.37
30 days	0	99.9	0.9	50	82	0.5	45	65	0.37

day. After incubation at 35° C. until 9:00 A.M. of the following day, the count and the titratable acidity of the milk in each flask were determined. These flasks were then stored at 5° C. Platings and acidity determinations were made at definite intervals during a storage period of 1 month.

It may be concluded from a study of Table II that high acidity or related factors present at the initiation of storage cause a rapid decrease in the number of *L. acidophilus* at 5° C. Conversely, a low acidity enhances the viability of this organism when stored at the same temperature.

TABLE III

SHOWING INFLUENCE OF STORAGE AT DIFFERENT TEMPERATURES ON VIABILITY

Length of Storage	at 11° C.			at 18° C.			at 20° C.			at 23° C.		
	Count per c.c.	Per Cent Decrease in Count	Acidity in Per Cent	Count per c.c.	Per Cent Decrease in Count	Acidity in Per Cent	Count per c.c.	Per Cent Decrease in Count	Acidity in Per Cent	Count per c.c.	Per Cent Decrease in Count	Acidity in Per Cent
At beginning	150		0.63	150		0.63	150		0.63	150		0.63
1 day	150	none	0.60	140	6	0.57	150	none	0.56	90	40	0.60
2 days	110	27	0.56	105	30	0.55	105	30	0.57	70	55	0.60
4 days	105	30	0.56	150	none	0.57	135	10	0.56	90	40	0.72
7 days	65	56	0.58	150	none	0.63	150	none	0.70	30	75	0.90
14 days	50	65	0.55	135	10	0.63	100	33	0.88	30	75	1.00
21 days	40	75	0.59	mouldy		0.63				5	97	1.40

EXPERIMENT III

Influence of different storage temperatures upon the viability of L. acidophilus in milk cultures of the same initial acidity.

Separate portions of a batch of acidophilus milk were stored at

different temperatures for a period of 3 weeks, during which viability and titratable acidity were determined at stated intervals.

The results of Experiment III are not exactly consistent with those of Experiment I, since they show to a slight extent a reverse relationship between storage at 23° C. and at 10–12° C. during the shorter periods of holding. These slight discrepancies can probably be attributed to the considerable inaccuracy in any quantitative method employed for determining living *L. acidophilus*. This experiment again indicates the considerable increase of acidity at 23° C., and shows that storage at 18° C. preserves a high viability of *L. acidophilus*, with no increase in acidity.

EXPERIMENT IV A

The influence of ripening temperatures upon the viability of L. acidophilus in milk cultures during storage.

Six flasks of sterilized milk were warmed to 38° C. Then each received an equal amount of *L. acidophilus* inoculum. Two were incubated at 35° C., 2 at 37° C., and 2 at 40° C. After 20 hours all were removed from the incubator. Viability counts and acidity determinations were made on 1 in each pair; 1 was stored at 5° C. and the other at 20° C. Viability counts and acidity determinations were made at stated intervals during 7 days.

TABLE IV A

SHOWING INFLUENCE OF DIFFERENT RIPENING TEMPERATURES UPON THE VIABILITY OF *L. ACIDOPHILUS* IN MILK CULTURES DURING STORAGE

Incubation Temperature	Storage Period	Storage at 5° C.			Storage at 20° C.		
		Count per c.c.	Per Cent Decrease	Acidity in Per Cent	Count per c.c.	Per Cent Decrease	Acidity in Per Cent
35° C.	At beginning	315	—	0.63	315	—	0.63
	1 day	305	3	0.63	380	none	0.88
	3 days	190	40	0.64	265	15	1.12
	7 days	190	40	0.64	270	12	1.50
37° C.	At beginning	410	—	0.72	410	—	0.72
	1 day	410	none	0.74	410	none	0.92
	3 days	110	70	0.73	280	30	1.11
	7 days	25	94	0.72	110	73	1.40
40° C.	At beginning	315	—	0.81	315	—	0.81
	1 day	285	9	0.81	210	33	1.00
	3 days	8	98	0.81	180	43	1.08
	7 days	3.5	99	0.81	124	60	1.12

EXPERIMENT IV B

This differed from IVA in that each pair of flasks containing sterilized milk was inoculated at a different hour during the day in order .

that the acidity of all the milk after ripening would be practically identical.

The results of Experiment IV indicate that the ripening temperature influences viability of *L. acidophilus* only in so far as increased acidity is concerned, and again demonstrates the weakening effect of high initial acidity or closely related factors upon *L. acidophilus* in storage. The organisms in the high acid milk died off more rapidly at 5° C. than at 20° C. However, the decided increase in acidity in 20° storage is highly undesirable.

TABLE IV B

SHOWING THE INFLUENCE OF DIFFERENT RIPENING TEMPERATURES ON VIABILITY DURING STORAGE AT PRACTICALLY UNIFORM ACIDITIES

Incubation Temperature	Storage Period	Storage at 5° C.			Storage at 20° C.		
		Count per c.c.	Per Cent Decrease	Acidity in Per Cent	Count per c.c.	Per Cent Decrease	Acidity in Per Cent
35° C. Inoculated at 11:30 A.M.	At beginning	355	—	0.73	355	—	0.73
	2 days	330	7	0.75	280	22	0.76
	4 days	280	20	0.77	275	23	0.80
	7 days	270	21	0.79	290	20	0.85
	12 days	190	46	0.79	270	24	1.02
37° C. Inoculated at 2 P.M.	At beginning	370	—	0.75	370	—	0.75
	2 days	360	3	0.79	280	24	0.78
	4 days	295	20	0.74	250	33	0.80
	7 days	235	36	0.76	245	35	0.81
	12 days	175	53	0.77	265	28	0.96
40° C. Inoculated at 5 P.M.	At beginning	360	—	0.77	360	—	0.77
	2 days	360	none	0.77	280	22	0.79
	4 days	275	24	0.79	290	20	0.81
	7 days	270	25	0.79	280	22	0.82
	12 days	160	55	0.80	260	26	0.95

EXPERIMENT V

The influence of butter fat upon viability of L. acidophilus in milk cultures during storage.

Two flasks of skimmed milk, 2 of milk containing 1 per cent butter fat and 2 of milk containing 4 per cent butter fat were inoculated with *L. acidophilus*. After 20 hours' incubation at 35° C., 1 of each pair was stored at 11° C. and the other at 20° C. Viability counts and reactions were determined for each flask at intervals during a storage of 3 weeks.

The results apparently demonstrate that the amount of butter fat has no appreciable effect on the viability of *L. acidophilus*.

TABLE V

SHOWING INFLUENCE OF BUTTER FAT ON VIABILITY DURING STORAGE
L. acidophilus Culture in Skimmed Milk

	Initial Count 320			Initial Reaction 0.60		
	Storage at 11° C.			Storage at 20° C.		
	Count per c.c.	Per Cent Decrease	Acidity in Per Cent	Count per c.c.	Per Cent Decrease	Acidity in Per Cent
2 days	350	none	0.58	430	none	0.73
4 days	220	30	0.58	330	none	0.82
7 days	130	60	0.60	330	none	0.98
9 days	110	70	0.59	180	44	1.09
20 days	75	90	0.59	70	80	1.60

L. acidophilus Culture in 1 Per Cent Butter Fat Milk

	Initial Count 335			Initial Reaction 0.58		
	Storage at 11° C.			Storage at 20° C.		
	Count	Per Cent Decrease	Acidity	Count	Per Cent Decrease	Acidity
2 days	290	13	0.54	360	none	0.72
4 days	275	18	0.54	280	15	0.74
7 days	250	25	0.55	240	27	0.91
9 days	130	60	0.58	240	27	1.00
20 days	30	91	0.61	50	85	1.30

L. acidophilus Culture in 4 Per Cent Butter Fat Milk

	Initial Count 315			Initial Reaction 0.59		
	Storage at 11° C.			Storage at 20° C.		
	Count	Per Cent Decrease	Acidity	Count	Per Cent Decrease	Acidity
2 days	310	1	0.59	340	none	0.72
4 days	310	1	0.61	340	none	0.86
7 days	270	14	0.60	340	none	1.05
9 days	190	40	0.58	250	25	1.10
20 days	70	75	0.61	40	84	1.35

EXPERIMENT VI

The acidophilus milk employed in all experiments reported thus far was prepared in the laboratory from a pure culture.

It appeared desirable to determine the viability of *L. acidophilus* in the commercial product under different storage conditions. Two shipments of acidophilus milk were secured from two producing concerns. These lots were chosen at random at the distributing points and sent to our laboratory. Shipment A was sent by parcel post. It was bottled January 24 and received at our laboratory January 26. The initial count per c.c. was determined January 27, when the con-

TABLE VI A

SHOWING INFLUENCE OF DIFFERENT STORAGE TEMPERATURES ON SAMPLES OF COMMERCIAL *ACIDOPHILUS* MILK

Storage Period	Storage at room temperature (21°-25° C.)			Storage at 18° C.			Storage in cold room (5°-10° C.)			Storage at 5° C.		
	Count per c.c.	Per Cent Decrease	Acidity in Per Cent	Count per c.c.	Per Cent Decrease	Acidity in Per Cent	Count per c.c.	Per Cent Decrease	Acidity in Per Cent	Count per c.c.	Per Cent Decrease	Acidity in Per Cent
At beginning	340	—	0.66	340	—	0.66	340	—	0.66	340	—	0.66
1 day	160	53	0.73	200	41	0.66	165	50	0.64	190	44	0.61
3 days	170	50	0.94	200	41	0.68	195	40	0.67	200	41	0.64
6 days	155	54	1.34	190	44	0.77	180	47	0.69	190	44	0.70
14 days	125	63	1.75	160	53	0.86	155	54	0.76	165	50	0.70
21 days	5	98.5	1.85	130	62	0.95	100	70	0.79	75	78	0.68

TABLE VI B

SHOWING INFLUENCE OF STORAGE ON *L. ACIDOPHILUS* AND ON BACTERIAL CONTAMINANTS

Storage Period	<i>L. acidophilus</i> per c.c.	Per Cent Decrease	Contaminants 20° C. Incubation	Acidity in Per Cent
Storage at room temperature (21°-24° C.)				
At beginning	500	—	none	.68
2 days	255	50	800	.81
4 days	240	52	30,000	.90
6 days	250	50	50,000	1.28
12 days	95	80	10,000,000	1.38
Storage at 18° C.				
2 days	200	60	600	0.72
4 days	250	50	8,000	0.76
6 days	275	45	143,000	0.81
12 days	110	80	10,000	0.82
Storage at 6°-10° C.				
2 days	165	67	0	0.69
4 days	185	63	0	0.72
6 days	170	66	0	0.76
12 days	30	94	400,000	0.80
Storage at 5° C.				
2 days	280	44	0	0.68
4 days	215	57	0	0.68
6 days	120	76	0	0.69
12 days	10	98	12,000	0.68

NOTE: In this table the *L. acidophilus* count is given in millions as in all other tables. The count of contaminants is the actual numbers per c.c.

trolled storage was begun. It was, therefore, 3 days old at this time.

Shipment B was delivered to us by express and was well iced during transit. This was 2 days old when the controlled storage experi-

ment began. The effect of storage temperatures on contaminating forms in B was determined.

Experiment VI is a practical demonstration of the effect of different storage temperatures upon the viability of *L. acidophilus* in commercial acidophilus milk.

At the completion of the storage period there was no apparent change in the flavor, acidity, etc., of the samples kept at 5° C. and 8° C. Samples of "A" stored at 20° C. and at 25°–27° C. did not have any "off" flavor or taste, but were too sour to be palatable. The taste of "B" kept at these same temperatures was decidedly "off" in addition to an excessive acidity. The large numbers of foreign bacteria developing at these higher temperatures were without doubt responsible for the "off" flavor.

DISCUSSION

Close inspection of the results reported in this paper should reveal several points of practical significance to those who are interested in the production and use of acidophilus milk.

The first and probably most important conclusion is that the maximum viability of *L. acidophilus* manifests itself in the freshly prepared product, with a fairly rapid decrease within any storage period. However, if we accept a required minimum of 100 or even 200 millions of viable organisms at the time of consumption, it should be stated in fairness to producers of high grade acidophilus milk, that reasonably satisfactory viability can be maintained for 2 or even 3 weeks without serious harm to the product. The maintenance of this standard for such periods requires strict adherence to certain rules governing proper preparation and storage.

From a strictly scientific standpoint, the observations of Kopeloff and Berman regarding viability of *L. acidophilus* during short storage periods are in a measure correct. However, only in rare instances during our experiments have the numbers of living *L. acidophilus* decreased after 3 days' storage to the extent reported by these investigators. From a practical viewpoint their recommendation for storage at room temperature is unwarranted and unnecessary, and if carried out would probably do the commercial product more harm than good.

The term "room temperature" is too variable in interpretation. So-called "room temperatures" range ordinarily from 18° C. to 30° C. It is quite probable that the continued high viability of *L. acidophilus* at "room temperature" is not a question of maintenance of the original organisms but is due to continued multiplication. The rate of this increase is dependent upon the temperature increment above 20° C.

The metabolism of *L. acidophilus* at temperatures above 21° C. is sufficient to cause an actual increase in numbers up to a maximum, but at the expense of the palatability due to an excessive increase in acidity. Over comparatively long storage periods at any temperature this increased acidity or the development of other metabolic products is markedly detrimental to viability. In addition, storage at room temperature may bring about the rapid development of contaminants, with resultant lowering of the efficacy and palatability of the product.

CONCLUSIONS

From the standpoint of palatability of *L. acidophilus* milk, the continued life of *L. acidophilus* in storage seemed to depend upon two factors—initial acidity or some related metabolic substance, and storage temperature, assuming that there is a minimum of contaminating growth. In order to insure satisfactory viability for 2 days to 1 week, commercial acidophilus milk of good quality may be stored at 5° C., provided the acidity at the time of bottling is not more than 0.65 per cent.

When the producer of acidophilus milk desires a satisfactory viability of *L. acidophilus* for more than 1 week, the following rules must be closely followed:

The number of foreign bacteria must always remain at a negligible figure.

Rigid precaution against excessive acidity must be observed.

The storage temperature should range between 12° C. and 16° C., the optimum viability temperature for *L. acidophilus* in milk being 16° C. when the initial acidity is 0.65 per cent.

REFERENCES

1. Kopeloff, N., and Berman, Philip. Some Temperature Studies on *B. acidophilus* Milk, *State Hosp. Quart.*, May, 1923.
2. Kulp, W. L. The Determination of Viable *L. acidophilus*, *Science*, 64, 304–306, 1926.
3. Kulp, W. L. An Agar Medium for Plating *L. acidophilus* and *L. bulgaricus*, *Science*, 66, 512–513, 1927.
4. Rettger, L. F., and Horton, G. D. A Comparative Study of the Intestinal Flora of White Rats Kept on Experimental and Ordinary Mixed Diets, *Centralbl. f. Bakteriol.*, 73, 362–372, 1914.
5. Rogers, L. A. The Inhibiting Effect of *Streptococcus lactis* on *Lactobacillus bulgaricus*, *J. Bact.*, 16, 321–325, 1928.

Diphtheria Immunization by Three and Four Injections of Toxin-Antitoxin

Comparative Trend of the Immunizing Process

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THE impression which has prevailed that 3 injections of diphtheria toxin-antitoxin are sufficient in a very large majority of cases to produce immunity in the course of a year or less has not been corroborated by our work in Oakland County rural schools.

The results of the immunization of over 8,000 children in the past 4 years were disappointing inasmuch as only 65 per cent of those given 3 injections became immune at the end of the first year.

Not being entirely satisfied with the results shown at the end of the first year by the use of 3 injections of toxin-antitoxin, we began the use of 4 injections in 1928 with the hope of obtaining more satisfactory results. A study was made to determine to what extent the trend of the immunizing process differs in two groups of children who received 3 and 4 injections of toxin-antitoxin: (1) at the end of the first year, and (2) at the end of the second year.

Four intramuscular injections of 1 c.c. of toxin-antitoxin were given to 946 rural children comprising a typically American group. Those children who for various reasons failed to receive the 4th injection comprised the other group of 336 children receiving 3 injections of toxin-antitoxin.

No preliminary Schick test was given because of the known high percentage of susceptibles. On other occasions when large groups of rural children were Schick tested about 94 per cent were found Schick positive. Toxin-antitoxin and diphtheria toxin for Schick test were furnished at all times by the Michigan Department of Health. The Schick test which was given 1 year following toxin-antitoxin was read by the writer throughout to insure uniformity of interpretation. The Schick test was read 1 week later than the injection to eliminate as far as possible the pseudo reactions.

Although we were aware of the fact that pseudo reactions occasionally last for more than 7 days, no controls were used. However,

the possibility of misinterpretation, though small, would exist to a similar degree in both groups and therefore would not affect the correct evaluation of the trend of the immunizing process.

The results of immunization by 4 injections of toxin-antitoxin as well as the comparison with results obtained by 3 injections are shown in detail in Figure I.

It will be noted that while 35.4 per cent of those who received 3 injections were still susceptible at the end of the year only 26 per cent of those who received 4 injections were susceptible at the end of the same period of time.

*TABULATIONS OF RESULTS OF IMMUNIZATION
BY THREE AND FOUR INJECTIONS OF TOXIN ANTITOXIN*

AGE GROUP	CHILDREN	NUMBER OF INJECTIONS			
		3		4	
		+	-	+	-
4-5-6	NUMBER	39	65	52	175
	%	37.5	62.5	22.4	77.6
7-8-9	NUMBER	28	69	92	255
	%	29	71	26.5	73.5
10-11-12	NUMBER	36	60	65	193
	%	37.5	62.5	25	75
13 AND OVER	NUMBER	16	23	38	76
	%	40	60	33.3	66.7
TOTAL	NUMBER	119	217	247	699
	%	35.4	64.6	26	74

FIGURE I

Careful follow-up work was done on 114 cases that received 3 injections of toxin-antitoxin in 1928 and which were found to be Schick positive 1 year after the administration of toxin-antitoxin. This group was Schicked again a year later, in 1930, and the results thus obtained reveal that 48 children, or only 42 per cent, remained positive at the end of the second year.

In the group of 946 children who received 4 injections of toxin-antitoxin in 1928, 247 were positive 1 year later; of this group 131 were carefully studied. At the end of the second year when this group of 131 was re-Schicked, 42 children, or only 32 per cent, remained positive.

Comparison of the results obtained at the end of 24 months in both groups comprising 245 Schick positive children indicates that 4 injections of toxin-antitoxin promote the development of immunity at the end of the second year to a greater degree than do 3 injections; of the Schick positive group which received 3 injections of toxin-antitoxin, 58 per cent changed to negative; while of the Schick positive children of a similar age group who received 4 injections of toxin-antitoxin 68 per cent changed to negative.

In the Schick test we have a definite means of determining susceptibility to diphtheria at the time the test is given. However, the susceptibility to diphtheria is lessened as time goes on and to a greater degree, in those who received toxin-antitoxin, with the ultimate result that immunity is built up, as shown in Figure II, from 64.6 per cent at the end of the first year to about 85 per cent at the end of the second year in those who received 3 injections of toxin-antitoxin, from 74 per

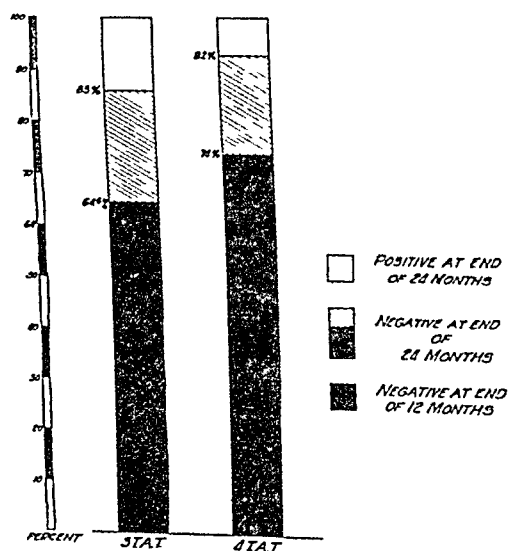
cent at the end of the first year to about 92 per cent at the end of the second year in those who received 4 injections of toxin-antitoxin.

It would appear that toxin-antitoxin is the most active factor in the progressive trend of the development of immunity since both groups could be equally affected by other contributory factors to immunity such as the natural development of immunity as age increases and the less important factor of mingling with unrecognized cases of diphtheria or diphtheria carriers.

In the practice followed by the great majority of health officers of giving the Schick test 6 months to a year after toxin-antitoxin, with the additional administration of toxin-antitoxin should the Schick test be found positive, an important factor is disregarded or at least not emphasized; the result of immunization is not final during the first 6 months or a year. Failure to consider this factor has resulted in a lowered estimate of the number of cases which ultimately become immune and has often led to the unnecessary administration of an additional series of toxin-antitoxin.

Inasmuch as it is probable that, because of the progressive trend of immunity, the Schick reaction will ultimately change to negative by the end of the second year in a large percentage of cases, it appears premature to give the Schick test at the end of the first year. On the other hand, it is obviously a difficult matter to give the Schick test 2 years after the administration of toxin-antitoxin because of the shifting school and preschool population.

What possible disadvantages may be encountered in omitting the Schick test? A survey concerning the re-Schicking practice in 104 cities made by Armstrong and Walker indicates that, even with the present routine, less than 35 per cent of children receiving toxin-antitoxin are subsequently Schick tested. Parents are advised that the child, after receiving toxin-antitoxin, will probably be protected against diphtheria, but because of the possibility that



STATUS OF IMMUNITY IN TWO GROUPS OF CHILDREN AT THE END OF 12 AND 24 MONTHS AFTER 3 AND 4 INJECTIONS OF TAT
FIGURE II

he might not be, they should consult the family physician should there be any evidence of sore throat. This point of view is in accord with

Park, who, in his book, *Public Health and Hygiene*, in discussing what should be done with a child who has received toxin-antitoxin or who has been shown to be immune by a negative Schick test, states:

If the child should develop a suspicious sore throat, it should then receive antitoxin even though the probability of the condition being diphtheria is very slight. There is no serious objection to giving the child an unnecessary dose of antitoxin, and it is known that serious harm may ensue if the child develops diphtheria and an early dose of antitoxin is not given, since we know there are slips with the Schick test.

An additional reason why this procedure should be carried out faithfully is the fact that Park, Parish, Okel and others have observed that the dictum "Once Schick negative always Schick negative" is an assertion subject to exceptions and that between 3 and 5 per cent of children previously Schick negative were found to be Schick positive upon re-testing.

Park, Scamman, Gordon, Schwalbe and others relate authentic cases of clinical diphtheria in persons previously Schick negative. This may be accounted for by the fact that the average amount of antitoxin in the system which is responsible for Schick negative reactions might have lessened since the test was done or occasionally be insufficient to withstand an unusually severe infection.

Factors such as smallpox vaccination (observation by Finkelstein) or an attack of scarlet fever (observation by Hull), are also apt, in their opinion, to change the Schick test temporarily at least from negative to positive by temporarily decreasing the diphtheria antitoxin in the body.

Kellogg's observations led him to the conclusion that the Schick test should be abandoned for routine use for a number of reasons, among them being the possibility of error in interpretation because of protein sensitization, local differences in the immunity of the tissue, etc.

The possibility of these occurrences though extremely rare should not be overlooked.

A study made by Gordon of 1,500 cases admitted to Herman Kiefer Hospital reveals that only 14.7 per cent gave history of having received toxin-antitoxin. The ratio of population of the groups receiving toxin-antitoxin and not receiving toxin-antitoxin indicates that a little over 50 per cent of school and preschool children in Detroit received toxin-antitoxin. Thus for each 6 or 7 cases of diphtheria which occurred in the unprotected group, there was but 1 case of diphtheria in the group that received toxin-antitoxin. The study is not complete, but information available as to how long toxin-antitoxin had been

given before diphtheria developed indicates that over 40 per cent of those having diphtheria received toxin-antitoxin less than 6 months previously.

A careful follow-up of the group termed "immunized" will probably reveal, according to Detroit health authorities, that many who gave a history of toxin-antitoxin had received some other injections instead; thus the presumably immunized group would be materially decreased. The reduction of diphtheria mortality in the group that previously received toxin-antitoxin is also quite impressive since it is only one-third of the prevailing mortality rate among those who did not receive toxin-antitoxin.

The study of Scamman and Pope on "Diphtheria Immunization of 15,000 Children in Providence" strikingly reveals that the incidence of diphtheria among the children who received 3 injections of toxin-antitoxin is 10 times less than that among the similar group of children that did not have toxin-antitoxin. It is reasonable to expect even better results with 4 injections of toxin-antitoxin.

The omission of the Schick test as a routine procedure is indirectly in accord with the present trend of encouraging the private practitioner to assume the responsibility of immunization. When the work of immunization is finally delegated to the family physician, to whom it rightfully belongs, he would be relieved of the necessity of making a delicate test and would be encouraged to urge toxin-antitoxin since there would be no necessity for following it up. The faith of parents in toxin-antitoxin would be enhanced since it would become common knowledge that 4 injections are all that is necessary in a large majority of cases.

The practice of omitting the Schick test altogether has been used with success in some communities. It seems justifiable under normal conditions, except perhaps among school children in large cities, to omit the Schick test because the health officer would thus be enabled to enlarge the group of protected children.

Under normal conditions the health officer is concerned with the community status of immunity and his efforts should be directed toward decreasing susceptibility to diphtheria in the community because it is well known that in spite of the most efficient epidemiological measures and practices, the majority of cases cannot be traced to a definite source of infection. This is shown by Benning in his study of 500 consecutive cases of diphtheria in Baltimore of which 77.6 per cent could not be traced to any definite source.

It should not, however, be implied that the Schick test should be omitted in times of unusual prevalence of diphtheria in a community

or institution where conditions are favorable for the spread of the disease, where it is necessary to know the exact status of immunity at all times, or for preliminary testing. It would, of course, remain an indispensable factor in research work.

SUMMARY

Studies to ascertain the development of immunity against diphtheria were carried on among 1,282 children. Group one, 336 children, received 3 injections of toxin-antitoxin and showed immunity after the first year in 64.4 per cent and after the second year in about 85 per cent. Group two, 946 children, received 4 injections of toxin-antitoxin and showed immunity after the first year in 74 per cent and after the second year in 92 per cent.

Four injections of toxin-antitoxin do not produce any more untoward reaction than 3 and are not impractical either in private practice or as a public health procedure in schools.

The use of 4 injections appears to be a preferable method of toxin-antitoxin administration until diphtheria toxoid has been sufficiently tested to justify its use in either preschool children alone or in all groups and ages.

The Schick test need not be given as a routine procedure at the end of the first year, if at all, after administration of 4 injections of toxin-antitoxin.

Simplifying the procedure by the omission of the final Schick test would encourage the private physician to undertake the work of immunization. The time saved by the omission of the final Schick test would enable the health officer to reach a larger group of unprotected children.

The Schick test would, of course, remain an indispensable test in research work, preliminary testing, in times of unusual prevalence of diphtheria in communities or institutions where conditions are favorable for the spread of the disease, or where it is necessary to know the exact status of immunity at all times.

These observations, though based on too small a group of children to justify drawing final conclusions, indicate a definite trend in the progress of the immunizing process after the first year to a much greater extent than has been commonly assumed and it is earnestly hoped that others will be stimulated to carry on similar studies.

BIBLIOGRAPHY

- Park, W. H. *Public Health and Hygiene*, 1928.
Rosenau, M. J. *Preventive Medicine and Hygiene*, 1927.
Sears, F. W. Further Observations on the Schick and Toxin-antitoxin Immunization against Diphtheria in the City of Auburn, *A. J. P. H.*, 14, 3: 210 (Mar.), 1924.
Kellogg, W. H. Should the Schick Test be Abandoned?, *A. J. P. H.*, 15, 10: 868 (Oct.), 1925.
(*Cont. on p. 890*)

- Stokes, Hogan and Ewing. Does Intensive Work on Carriers Decrease Diphtheria?, *A. J. P. H.*, 15, 10: 873 (Oct.), 1925.
- Scamman, C. L., and Pope, A. S. Diphtheria Immunization in Providence, *J. A. M. A.*, 88: 563-565 (Feb 19), 1927.
- A Review from German Publications on The Value of Protective Inoculation against Diphtheria, *J. A. M. A.*, 90: 558-560 (Feb 18), 1928.
- Finkelstein. Abstract—Schick Reaction and Cow-pox Vaccination, *J. A. M. A.*, Apr. 21, 1928.
- Parish, H. O., and Okel, C. C. Permanence of Schick Negative State, *Lancet*, Aug. 18, 1928, pp. 322-323.
- Hull, T. G. Schick Test and Scarlet Fever, *J. Lab. & Clin. Med.*, Dec., 1925, pp. 260-261.
- Benning, C. H. A Study of the Probable Mode of Infection in 500 Cases of Diphtheria. Not yet published.
- Gordon, J. E. Study of 1,500 Diphtheria Admissions to Herman Kiefer Hospital. Article not yet published.

Drought Area

DURING the fiscal year beginning July 1, 1931, we shall have available for co-operative work in the drought-stricken area approximately \$1,500,000, or such part thereof as may be necessary. For the counties not included in this area there will be available the regular rural sanitation appropriation of \$338,000. Estimates and budgets for proposed projects under each of these appropriations were requested early in May, for the coming fiscal year, and those approved will become effective July 1, 1931. The possible total, therefore, which the public health may have invested in coöperative county health work during the year July 1, 1931, to June 30, 1932, is approximately \$1,838,000.

* * * * *

As regards the consultation and advisory service there can be no doubt of the value of professional advice and assistance to communities and states by competent experts in the several phases of public health. Such service is now being organized on a modest scale in connection with the drought relief work, and its value and possibilities will be readily apparent to those of you to whom it is possible to extend it.—Assistant Surgeon General W. F. Draper, *United States Daily*, May 9, 1931.

What Social Work Is Not

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SOCIAL work has been called many things. Here are seven things to remember that social work is not:

1. Social work does not signify social secretarial work; nor is it to be construed as in any sense related to the activities of the so-called society world. Social workers are recruited from all walks of life and their profession is not limited in scope of service to any particular class or creed.

2. There is a misconception of social work as the doling out of material relief by a "Lady Bountiful."

Of course, there always has been and always will be in the world a place for the individual who, from his plenty, is ready to give to those who are in need. Without this spirit the world would be a sorry place indeed, and professional social workers would be at a loss to find the funds for necessary relief. It is not, therefore, this spirit of giving with which we quarrel, nor do we want to belittle the value of the gifts or the sincerity of purpose. It is necessary, however, to explain that relief giving is not the sole function of the social worker. Money is, naturally, one of the tools with which she works but it is not given or withheld according to the fullness or emptiness of the exchequer—or merely on an impulse.

The professional social worker is trained in the scientific method of handling her problems. For instance, a man asks for the price of a meal for which he honestly cannot pay. The social worker immediately says to herself: "Why is this man in need? How much better off will he be if I give him money for one meal? What can I do to be of real help to him?" The man may be ill or out of work. It would be easy to give what he asks and dismiss the matter. But how much more effectively she can help if she understands his real need! If she learns that he is out of work, she endeavors to help him in his search for a job.

If he is physically unable to work, she will first arrange for him to secure medical treatment. Later she will put him in touch with employment bureaus or help him to make whatever other adjustment may be indicated in order that he can carry on for himself. This of

necessity requires time, and the man must be given aid until he is able to stand on his own feet. It is a decidedly better investment for the social worker to spend time helping him to work out his own problem than to encourage him to go from one individual to another seeking help which will suffice only for the moment.

If he is a professional tramp, he will not respond to social treatment by the scientific method. The self respecting individual, however, who is down on his luck through misfortune, weakness, or ill health, welcomes the chance to do his part and will often redouble his own efforts when he feels that some one is trying to help in an understanding way.

3. I want to stress the fact that the social worker is not a meddler, making unnecessary inquiries merely out of curiosity, or a desire to prove the individual or family unworthy of aid. She investigates in order to determine the need and formulate an intelligent plan whereby she can meet that need.

The business man satisfies himself as far as possible that a contemplated investment is a sound business proposition. The social worker invests time and energy in working out a social problem. She must have reasonable expectation of satisfactory returns in the social adjustment she seeks. Besides, she is responsible for her expenditure of time and money to the public, to whom an injustice is done if she does not use them wisely.

Frequently the social worker is called upon to help in some home adjustment. It is difficult enough to advise and assist a family when all the facts are at hand. To try to do so without a knowledge of the true family situation may lead to a wholly inadequate or unfair solution, such as the placing of too great a burden upon an individual, or an unjust shifting of responsibility to the community.

Again, in making plans for the child who has no family, it is of vital importance both to the child and to the foster parents that the personnel, the environment, and the moral and physical aspects of the home be suitable. It is unfair, for instance, to place a child in a home in which his moral or physical welfare is not assured. It is just as unfair to the parents to admit to their home a child who may be a physical or moral menace to their own children. Careful investigation is necessary for the protection of the family and the needy child.

In every form of social work, it is essential that the worker shall learn what the need is, what has caused the need, and what resources she can call upon besides her own skill and ingenuity. All her efforts are based on a desire to be of service, and to meet the need with the

most effective, constructive plan possible. There are, of course, blunders in social work as there are in all fields of endeavor, but fortunately they are not representative of the group.

4. There is a special type of social service, medical social work. This is not identical with nursing, although these fields are very closely allied. The medical social worker does not concern herself directly with the physical care of the patient. The basis of her work is the medical need of the patient, but the service she renders is social treatment.

She brings to the attention of the doctor significant data regarding the patient's environment, family and responsibilities—information which aids the doctor in making a diagnosis or recommending treatment. Then she helps the patient to carry through the plan of treatment ordered by the doctor. The social worker first ascertains whether it is possible for the patient to follow the doctor's directions, for hospitalization, treatment or rest, or hygienic living. If not, she must try to remove whatever obstacles there may be. It is futile, for example, for the doctor to advise a long rest for a man who must support his family and cannot give up his job. Unless some help can be given him, he will not have the necessary medical attention and before long will be physically unfit for work. It is the responsibility of the social worker to help him in making a temporary plan for his family so that he can have the necessary rest.

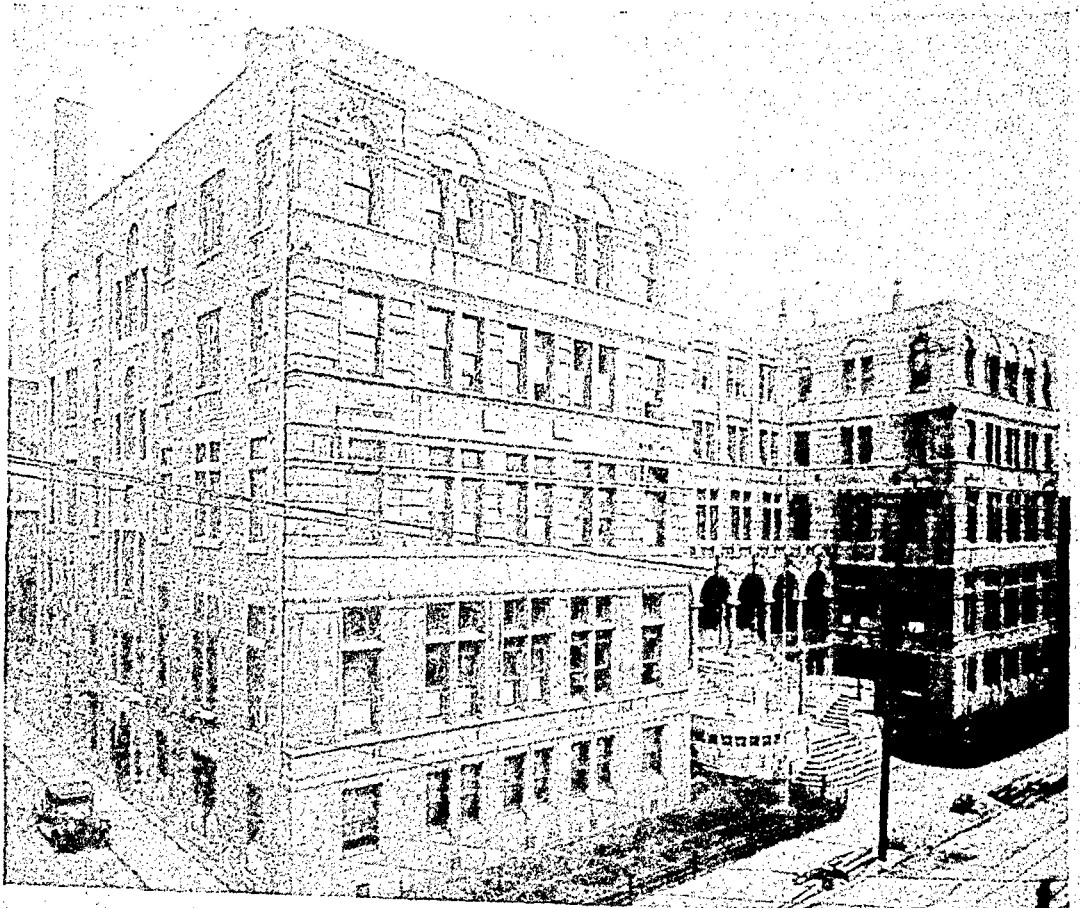
Sometimes the social worker will need to explain a patient's condition to the family and secure their help in placing him under treatment. Often she helps the patient to understand the medical plan. The problems presented to the medical social worker are many and varied, but always she must consider the individual patient with his medical problem in his relationship to his family and the community. Whether the social worker is found in the hospital, clinic, or health department, she strives to help the sick individual to make such adjustments as will speed his return to health, and the well person to live in such a way that his health will be protected.

5. The social worker has no panacea. When a problem is presented to her, she uses every known resource in her effort to solve it, but she does not always realize her hopes for the individual or group in need. She does not work alone. Health agencies, relief agencies, settlements, churches, and many other organizations rendering specialized services may be called upon to advise and assist her. Without this team play, constructive accomplishment would be difficult. Even with her best efforts, however, it is not always possible to stimulate in an individual that which will enable him to win out for himself.

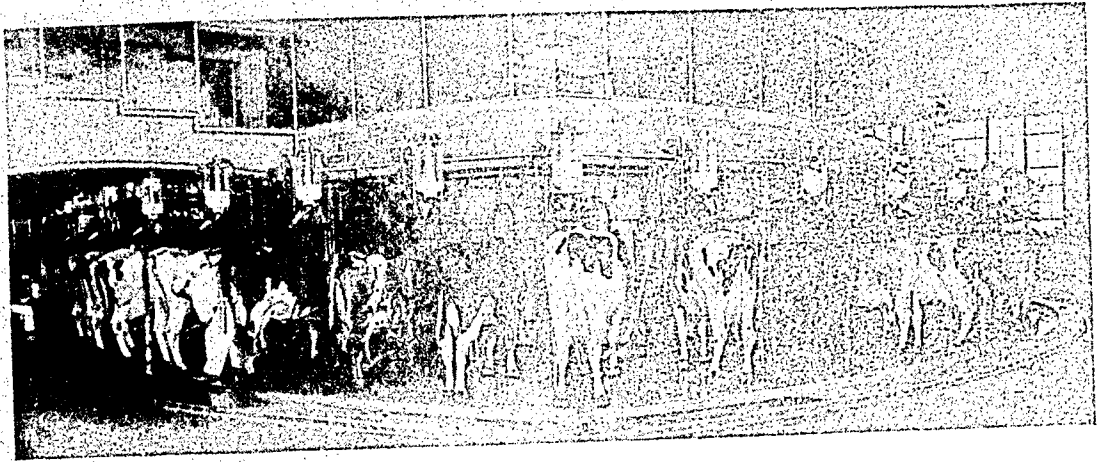
6. Again, the efforts of social workers are not limited to case work. Through service to the individual and the group, they become cognizant of existing unsatisfactory social conditions and bring these before the public for remedy. Some of our soundest legislation has been the outgrowth of such service.

7. Social work is not and never can be divorced from spirituality. The very foundations of social service rest upon man's need for expressing his religion. In service to his fellowmen, he satisfies in a small measure this need. Sometimes the motive seems to be lost sight of in the necessity for practical methods but underlying there is the fundamental element of spirituality.

Social work has been described as "any form of persistent and deliberate effort to improve living or working conditions in the community, or to relieve, diminish or prevent distress, whether due to weakness of character, or to pressure of external circumstances. All such efforts may be conceived as falling under the heads of charity, education or justice, and the same action may sometimes appear as one or another according to the point of view."



Laval University (French College), Montreal



Hygienic and Sanitary Features of Milk Production by the Rotolactor Process

JOHN G. HARDENBERGH, V. M. D.

The Walker Gordon Laboratory Company, Plainsboro, N. J.

MENTION was made in the December, 1930, issue of the *Journal* (p. 1389) of a new system of producing milk by means of the "Rotolactor," developed and used by the Walker-Gordon Laboratories, Plainsboro, N. J. Since this system embodies several features which contribute unusual sanitary safeguards to the production of clean milk, the following survey of the process is of interest to health officers and other readers.

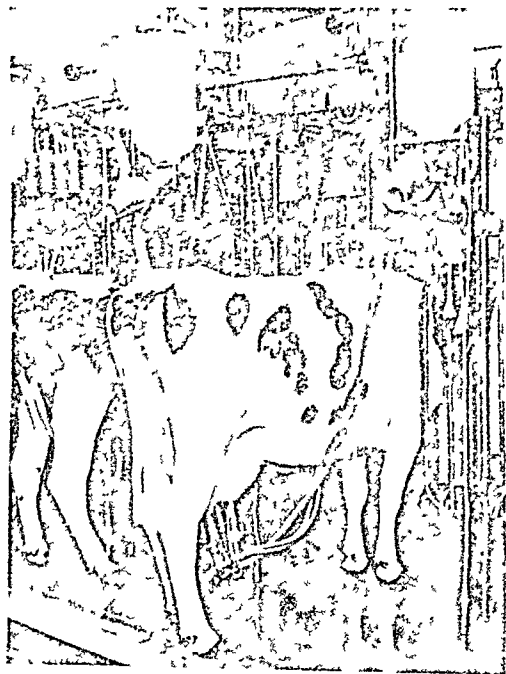
The rotolactor, as shown in the illustrations, is a rotary milking unit or slow motion merry-go-round—a circular platform on which cows are washed and milked at the rate of 240 an hour. The cows step on and off the moving platform at the rate of one every 15 seconds, but there is an intervening ride of $12\frac{1}{2}$ minutes during which the cleaning, foremilk and milking operations are carried on. The operation is continuous until all the cows have been milked.

The motives actuating the development of the rotolactor were the desire to make possible the volume production of clean milk under the most advanced conditions of hygiene and sanitation, and to demonstrate such a system to the end that it might lead to the development of better milk supplies on a wide scale.

In operation the cows move from their living quarters into a separate building and a room devoted only to milking. This room is especially equipped and designed with one principal objective—cleanliness. Walls and floors are tiled and kept clean. The air in the building is filtered and washed so that atmospheric conditions are nearly ideal; there is a complete absence of dust and objectionable odors. There

can be no doubt of the desirability of such a milking room compared to the compromise conditions which confront milk producers in the usual cow stable where there is a continual struggle between factors of stable hygiene, milk hygiene and cow comfort.

The rotolactor provides special means for washing the cows. Except in a few sections of the country where climatic conditions require that cows be stabled only at milking time (and even in these sections only rarely), has it been possible or customary to employ effective quantities of water in preparing cows for milking. On the rotolactor, the cows are subjected to a series of warm spray washes and showers directed particularly against the posterior quarters and udder. These automatic showers are augmented by 2 men with hand hoses, supplying warm water under considerable pressure, who devote their attention to the cleansing of udders and flanks. This is followed by drying of the teats and udders with clean individual towels. Such operations insure the almost complete elimination of foreign materials that might gain entrance to the milk.



Milk goes from the cow's udder to the pyrex glass without being exposed to the air and without any possibility of contamination.

baths as soon as the milk of one cow is discharged from it, giving a clean and practically sterile milking unit, from teat cups to pyrex glass jar, for each cow. Such care of utensils has never before been accomplished and is believed to answer criticisms previously made of the production of high grade milk with machines. The pyrex glass jar also permits inspection of the milk as it comes from the cow and so furnishes an additional check on its quality.

The arrangements for collecting and handling the milk after it leaves the glass jars are such that there is only a momentary exposure

to the atmosphere. The milk is discharged into previously cleaned and sterilized tanks from which it is pumped through sterilized sanitary lines to the coolers, into glass lined mixing tanks, and thence to the automatic bottling and capping machines. Within little more than a minute from the time it leaves the cow, the milk has been cooled, and is maintained at a low temperature until delivered.

With respect to the spread of disease in man through milk, the human element constitutes one of the most important as well as one of the weakest factors. With the rotolactor, human contact even of a remote character is reduced to a minimum. Thus, in milking cows at the rate of 240 an hour, there are only 4 men who are possible contacts: a foremilk, 2 men who attach teat-cups (but who touch the teats scarcely at all), and the attendant of the bottling machine. With these men under effective medical supervision, as well as all others who are even remotely associated with milk production, the possible dangers due to human contacts are as nearly eliminated as is possible, a trend which is now foremost in the preparation of all quality food products.

The production of high grade milk on the volume basis which justifies the construction of such units as the rotolactor makes possible a centralization of control and effective supervision at the source which is not economically feasible with the small scattered units that characterize our present milk supplies.

The construction of the rotolactor building with its visitors' gallery behind glass partitions is such that there can be unlimited observation and study of all milking procedures without the objections which attend the passage of visitors and others through the usual milking stables. With such a machine, backed up by healthy cows and healthy employees, the milk is provided with real protection against the entrance of extraneous bacteria or foreign matter. The degree of purity attained amply justifies the pains taken to accomplish it.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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MONTREAL

SOMETHING of the history of Montreal is given in July issue of the JOURNAL, a story full of romance, showing the vision, courage and persistence of the pioneers who founded the city. From the medical and public health standpoint, a full chapter could be written. Without disparagement to the many eminent professional men whose names are associated with its institutions, we may mention two who stood preëminent, William Osler and Wyatt Johnston.

Born in Canada, and always having retained his allegiance to that country and England, Dr. Osler spent much of his professional life in the United States, and while he was first of all a student and teacher of internal medicine, his interests were wide. He was one of the founders of the National Tuberculosis Association. Two years after his graduation from the Toronto Medical School in 1868, he began the work which made him famous in the Montreal General Hospital. In 1872 he was offered the chair of Botany at McGill University, in 1874 became Lecturer in the Institutes of Medicine, and was made Professor of Medicine in 1875. All know of the brilliant record he made. In 1884, he accepted a call to the University of Pennsylvania, leaving there for Baltimore when Johns Hopkins was founded, where he remained until made regius professor at Oxford, England.

The story of Wyatt Johnston is more closely connected with our association, of which he was a member from 1892 until his death, June

19, 1902. His untimely death was a blow to science as well as to our organization. He introduced the Widal Test into America. At our meeting in Buffalo, 1896, he read a paper entitled: "On the Application of the Serum Diagnosis of Typhoid Fever to the Requirements of Public Health Laboratories." Some 27 specimens of blood were sent without histories from Montreal to him at the meeting, and the correct diagnosis made in each case. Following this paper and demonstration, the application of the test rapidly spread over the continent until it became a standard procedure.

Members of our Association will find much of interest in the beautiful city which is to be our host, and we can do nothing better while there than to lay a wreath on the grave of Wyatt Johnston in Mount Royal Cemetery.

SCURVY AND ITS PREVENTION

IN spite of the fact that scurvy was described in 1250,¹ when the first clear accounts of it were given, again in the 15th century when long sea voyages became more frequent, and later in the especially clear account given of the voyage of Vasco di Gama, 1498, during which 55 sailors died, there still seems to be much lack of recognition of the facts, especially those concerning its prevention and cure.

Many writers attribute the discovery of its cause and cure to Capt. Cook, who during his three voyages was very successful in preventing the disease. Such articles as that by Captain Angus² have brought the misunderstanding down to very recent times. This author says, "It was left to the son of a farm labourer, born in 1728, . . . to prove during his three long voyages of exploration how this pest could be completely vanquished." As regards Captain Cook, there seems to be no doubt that before the "Endeavour" sailed, August 26, 1768, the Lord of the Admiralty wrote to him (then Lieutenant) that Dr. David MacBride (1727-1778) in *Experimental Essays on the Scurvy and Other Subjects*, and *An Historical Account of the New Method of Treating the Scurvy at Sea*, had pointed out the means of preventing this scourge. "Fit Experiments" during the voyage according to these methods were ordered, and the Commissioners of the Victualling were directed to put on board the ship a quantity of the antiscorbutics. The Surgeon was to keep an exact journal "describing the several symptoms and relating the progress and effects from time to time, 'which journal is to be transmitted to us at the end of the voyage.'" The lists of foods supplied are extant, in addition to which it is well known that Capt. Cook added wild celery and other wild herbs whenever he was able to collect them. He paid especial attention to per-

sonal cleanliness, the avoidance of wet clothing, and clean quarters, and gave untiring supervision to the health of his men. It seems, then, that credit must be given to Capt. Cook for having been the first to put into effect such measures. He undoubtedly showed, in spite of his lack of education, remarkable judgment, and there is no desire to contradict the accepted fact that his success was due largely to his personal actions. Other voyagers had had antiscorbutics on their ships, yet scurvy occurred. There seems to be just as little doubt that to Dr. David MacBride the suggestions of the causes of scurvy and, as far as Captain Cook is concerned, its prevention were due.

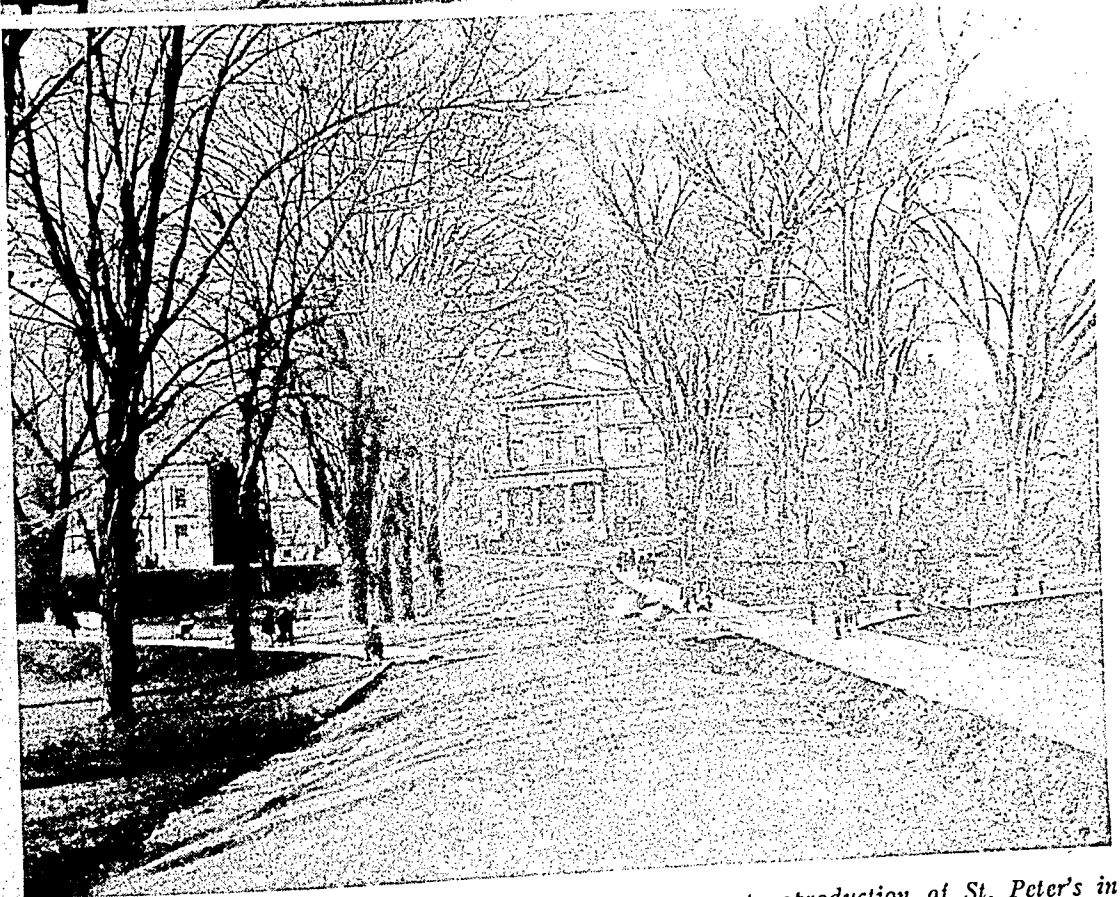
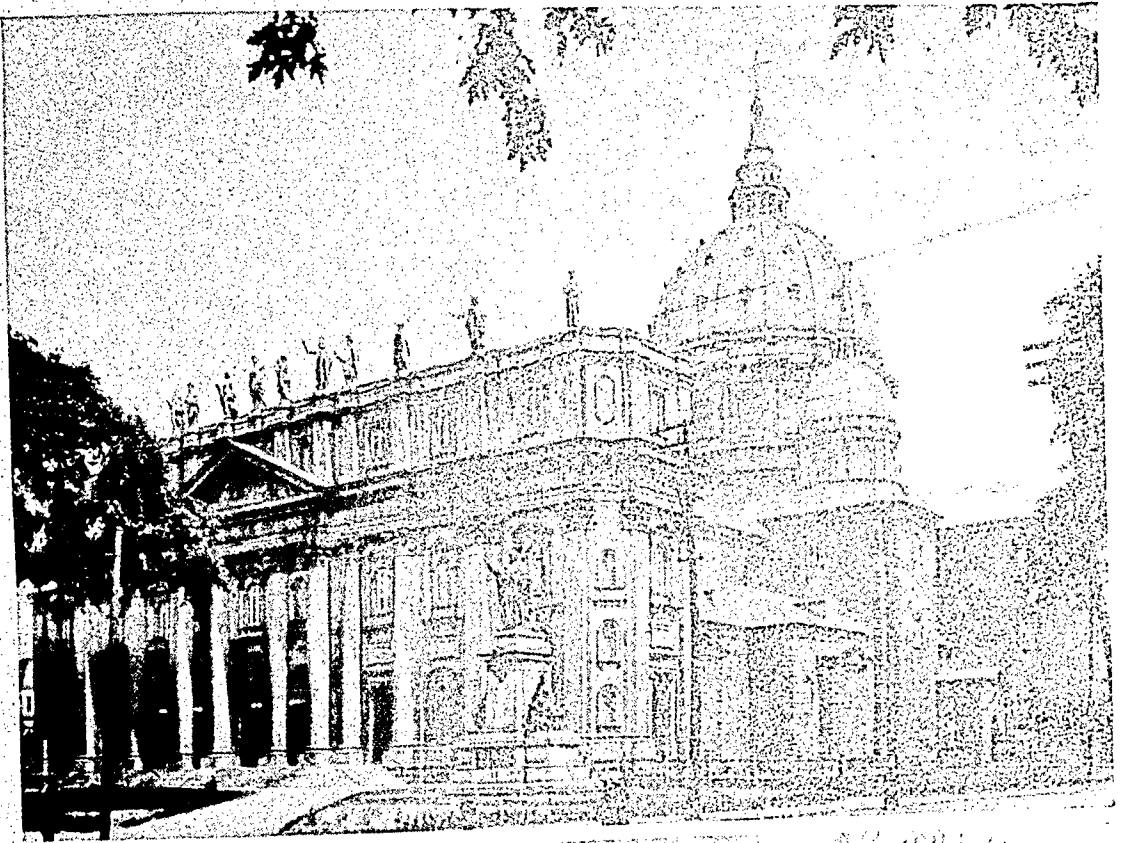
About the same time a number of other English physicians wrote on scurvy, prominent among whom are James Lind (1736-1794) and Thomas Trotter (1785), the latter of whom wrote a "*Medicina nautica*" or a general treatise on the diseases of seamen. However, earlier, John Woodall, born about 1569, was made Surgeon General to the East India Company in 1612, and about this time wrote "*The Surgeon's Mate*." While a surgeon by profession, and having served as a military surgeon in 1589 to the troops sent by Elizabeth to the aid of Henry IV of France, he wrote also a "*Treatise on the Plague*," and another on "*Gangrene and Sphacelus*," all of which were collected into one volume and published in 1639. As far as the present discussion is concerned, his most valuable work was on "the scurvy" in which he described the disease and methods of cure. It is true that he made some mistakes, but he asserted that its principal cause was the long use of salt provisions, coupled with a want of cleanliness and proper change of apparel. He further gave first place in its prevention and treatment to the juice of lemons, but recommended various other acid vegetable juices and fruits. In 1720, Kramer, "*Medicina Castrensis*," spoke positively of the curative properties of green vegetables, oranges, lemons, and citrons, and told how to preserve the pulp of the citrous fruits for prolonged use.

Writing in 1780, John Aiken¹ refers to "the very ingenious Dr. MacBride," and states that he particularly commended the treatise of Dr. Woodall and quoted from it. He further expressed his surprise that few of the writers of the time had mentioned him or his work.

". . . I hold strongly with the statement that it is a sign of a dry age when the great men of the past are held in light esteem."

REFERENCES

1. Bass, John Hermann, M.D. *Outlines of History of Medicine and the Medical Profession*, 1889.
2. *Brit. M. J.*, Dec. 31, 1927.
3. Purdy, J. S. *Med. Off.*, Dec. 22, 1928.
4. Aiken, John, Surgeon. *Biographical Memoirs of Medicine in Great Britain*, 1780.



Upper—St. James Cathedral (Roman Catholic), an exact reproduction of St. Peter's in Rome, one-quarter the dimensions.

Lower—Arts Building of McGill University. The founder, James McGill, is buried under a small monument before the portico. A Royal Charter conferring University powers was obtained in 1821. McGill is one of the foremost seats of learning in North America.

PRELIMINARY PROGRAM OF THE SIXTIETH ANNUAL MEETING

AMERICAN PUBLIC HEALTH ASSOCIATION

Montreal, Quebec, September 14-17, 1931

THE Annual Meeting Program Committee presents herewith the preliminary program of the scientific sessions of the American Public Health Association and information concerning meetings of related organizations held in connection with the Sixtieth Annual Meeting.

Scientific trips are announced elsewhere in this *Journal*. Entertainment plans, always important features of the Annual Meeting, are not listed at this time. The next issue of the *Journal* will provide details about them.

The 3-day post-convention trip to Quebec and the Saguenay River has been announced to members in correspondence and will be referred to again in a later *Journal*.

Since the following program cannot be considered definite in every respect now, delegates are urged to consult the final program, available at the Registration Desk in the Windsor Hotel at the time of the meeting. Exact hours and places will be announced therein.

GENERAL SESSIONS

First Session—Monday Evening

Invocation. MGR. GEORGES GAUTHIER, Archbishop Coadjutor of Montreal and Chancellor of the University of Montreal.

RT. REVEREND J. C. FARTHING, Anglican Bishop of Montreal.

Addresses of Welcome.

S. BOUCHER, M.D., D.P.H., Director, Department of Health, and Chairman of the Local Committee, Montreal, Que.

HIS WORSHIP CAMILLIEN HOUDE, Mayor of Montreal.

HONORABLE ATHANASE DAVID, Provincial Secretary, Quebec, Que.

HONORABLE MURRAY MACLAREN, Minister of Pensions and National Health, Ottawa, Ont.

E. W. BEATTY, LL.D., Chancellor, McGill University, Montreal, Que.

JOHN A. AMYOT, M.D., Deputy Minister of Health, Ottawa, Ont.

ALPHONSE LESSARD, M.D., Director, Provincial Bureau of Health, Quebec, Que.

Address of the President of the American Public Health Association. HUGH S. CUMMING, M.D., Surgeon-General, U. S. Public Health Service, Washington, D. C.

Reception and Dancing.

*Second Session—Luncheon—Thursday***Reports of the Four Standing Committees of the Association:**

Committee on Administrative Practice. *Chairman*, C.-E. A. WINSLOW, DR.P.H., Yale University, New Haven, Conn.

Committee on Fellowship and Membership. *Chairman*, SALLY LUCAS JEAN, New York, N. Y.

Committee on Meetings and Publications. *Chairman*, C. C. YOUNG, D.P.H., Director of Laboratories, State Department of Health, Lansing, Mich.

Committee on Research and Standards. *Chairman*, ABEL WOLMAN, Chief Engineer, State Department of Health, Baltimore, Md.

Third Session—Banquet—Thursday Evening

The Duty of the State in the Matter of Health. HONORABLE ATJIANASE DAVID, Provincial Secretary, Quebec, Que.

Announcement of Awards.

Dancing.

SPECIAL SESSIONS**SYMPOSIUM ON TOXOID IMMUNIZATION***Tuesday Morning*

Presiding: C. C. YOUNG, D.P.H., Director of Laboratories, State Department of Health, Lansing, Mich.

Toxoid versus Toxin-antitoxin in Immunization of Children under Various Conditions. WILLIAM H. PARK, M.D., and MAY C. SCHROEDER, M.D., Bureau of Laboratories, Department of Health, New York, N. Y.

The Degree of Immunization in the Guinea Pig from the Injection of Diphtheria Toxoid, (a) of Different Strengths, (b) at Various Intervals, and (c) of Treated Toxoids. OLGA R. POVITZKY, M.D., Bureau of Laboratories, Department of Health, New York, N. Y.

Discussion. P. J. MOLONEY, PH.D., Connaught Laboratories, University of Toronto, Toronto, Ont.

Advantages of Toxoid in Diphtheria Prophylaxis. W. T. HARRISON, M.D., National Institute of Health, Washington, D. C.

Experiences with Toxoid in Toledo. JOHN L. LAVAN, M.D., Commissioner of Health, Toledo, O.

Experiences with Toxoid in Canada. R. D. DEFRIES, M.D., D. T. FRASER, D.P.H., NEIL E. MCKINNON, M.B., and P. J. MOLONEY, PH.D., Connaught Laboratories, University of Toronto, Toronto, Ont.

The Inunction Method of Immunization Against Diphtheria. C. C. YOUNG, D.P.H., Director of Laboratories, C. D. BARRETT, M.D., Epidemiologist, State Department of Health, Lansing, Mich., and MORTIMER BYE, William S. Merrell Company, Cincinnati, O.

Concentrated Toxoid. W. E. BUNNEY, PH.D., State Department of Health, Lansing, Mich.

SYMPOSIUM ON RURAL SANITATION

Wednesday Morning

Presiding: JOHN A. FERRELL, M.D., DR.P.H., Associate Director, International Health Division, Rockefeller Foundation, New York, N. Y.
Rural or County Health Service.

Viewed from National Standpoint: Importance, Policies, Support. JOHN A. AMYOT, M.D., Deputy Minister of Health, Ottawa, Ont., RAFAEL SILVA, M.D., Director of Public Health Department of Mexico, Mexico City, Mex., and HUGH S. CUMMING, M.D., Surgeon-General, U. S. Public Health Service, Washington, D. C.

Viewed from Provincial and State Standpoints: Organization, Financing, Program, Personnel. ALPHONSE LESSARD, M.D., Director, Provincial Bureau of Health, Quebec, Que., A. T. MCCORMACK, M.D., State Health Officer, Louisville, Ky., and F. J. UNDERWOOD, M.D., State Health Officer, Jackson, Miss.

Viewed from the County Standpoint: Organization, Activities, Financing, Personnel. J. E. SYLVESTRE, M.D., Health Officer, Levis County, Que., R. M. ATWATER, M.D., DR.P.H., Health Officer, Cattaraugus County, Olean, N. Y., J. B. BLACK, M.D., County Health Officer, Rutherford County, Murfreesboro, Tenn., and W. A. MCINTOSH, M.D., State Department of Health, Lansing, Mich.

Discussion. W. F. DRAPER, M.D., Assistant Surgeon-General, U. S. Public Health Service, Washington, D. C., E. L. BISHOP, M.D., State Commissioner of Health, Nashville, Tenn., THOMAS PARRAN, JR., M.D., State Commissioner of Health, Albany, N. Y., and ALLEN W. FREEMAN, M.D., Professor of Public Health Administration, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

SYMPOSIUM ON HEALTH FACTS AND HEALTH EDUCATION

Thursday Morning

Presiding: CHARLES F. WILINSKY, M.D., Deputy Commissioner, Child Hygiene Division, Department of Health, Boston, Mass.

What to Tell (Health Facts). DONALD B. ARMSTRONG, M.D., Sc.D., Fourth Vice-President, Welfare Division, Metropolitan Life Insurance Company, New York, N. Y.

Motivating Men. EDWARD L. BERNAYS, Counsel on Public Relations, New York, N. Y.

What Is Health News? GEORGE F. WRIGHT, Editor, *Montreal Daily Star*, Montreal, Que.

Cholera Prevention Parade in Shanghai. *Motion Picture.* W. W. PETER, M.D., DR.P.H., Director, Health Service, Cleanliness Institute, New York, N. Y.

JOINT SESSIONS

PUBLIC HEALTH EDUCATION AND PUBLIC HEALTH
NURSING SECTIONS*Monday Morning*

HEALTH EDUCATION IN HIGH SCHOOL

What Constitutes Health Education in the High School? IAGO
GALDSTON, M.D., Medical Information Bureau, New York Academy of
Medicine, New York, N. Y.

Health—Where Can It Be Taught? PROFESSOR CLAIR E. TURNER,
Massachusetts Institute of Technology, Cambridge, Mass.

How It Is Being Taught by a Public Health Nurse. ETTA A.
CREECH, R.N., Teacher of Hygiene, Heights High School, Cleveland
Heights, O.

CHILD HYGIENE AND PUBLIC HEALTH NURSING SECTIONS

Monday Afternoon

Presiding: C. M. HINCKS, M.D., Director, Canadian National Committee
for Mental Hygiene, and General Director, United States National
Committee for Mental Hygiene, Toronto, Ont.

SYMPOSIUM ON MENTAL HYGIENE

When Is a Community Ready for a Mental Hygiene Clinic Service?

Mental Hygiene Concepts. GEORGE K. PRATT, M.D., Associate
Medical Officer, National Committee for Mental Hygiene, New York,
N. Y.

Minimum Community Provisions Necessary in Related Fields of
Endeavor.

a. Education. No author.

b. Social Work. C. C. CARSTENS, PH.D., Executive Director,
Child Welfare League of America, New York, N. Y.

c. Medical. No author.

d. Public Health Nursing. KATHARINE TUCKER, R.N., General
Director, National Organization for Public Health Nursing,
New York, N. Y.

A Suggested Community Program. GEORGE S. STEVENSON, M.D.,
Field Consultant, National Committee for Mental Hygiene, New
York, N. Y.

Discussion. STANLEY H. OSBORN, M.D., State Commissioner of Health,
Hartford, Conn.

What Can a Community Do When It Is Not Yet Ready to Estab-
lish a Mental Hygiene Clinic?

Suggestions for Local Consideration. HERMAN G. WEISKOTTEN, M.D., Dean, College of Medicine, Syracuse University, Syracuse, N. Y.

Discussion. EFFIE J. TAYLOR, Professor of Nursing, Yale University School of Nursing, New Haven, Conn.

HEALTH OFFICERS AND EPIDEMIOLOGY SECTIONS

Thursday Morning

Control of Syphilis from the Epidemiologist's Point of View. THOMAS PARRAN, JR., M.D., State Commissioner of Health, Albany, N. Y.

Syphilis in a Rural Colored Population in Tennessee. E. L. BISHOP, M.D., State Commissioner of Health, and associates of the State Department of Health, Nashville, Tenn.

Practicability of Epidemiological Methods in the Control of Syphilis. WILLIAM L. MUNSON, M.D., District Health Officer, Granville, N. Y.

Control of Syphilis from the Health Officer's Viewpoint. N. A. NELSON, State Department of Health, Boston, Mass.

LABORATORY AND FOOD, DRUGS AND NUTRITION SECTIONS

Wednesday Morning

Types of Streptococci in Infected Udders That Show No Clinical Evidence of Mastitis. G. J. HUCKER, PH.D., Chief in Research, New York State Agricultural Experiment Station, Geneva, N. Y.

Health Examinations of Milk Handlers. MILLARD KNOWLTON, M.D., and HARRIET BIXBY, State Department of Health, Hartford, Conn.

Bacteriological Studies of an Epidemic of Septic Sore Throat. W. D. FROST, DR.P.H., MILDRED GUMM and W. D. STOVALL, M.D., Laboratories of Agricultural Bacteriology and the Hygienic Laboratory, University of Wisconsin, Madison, Wis.

Montreal Milk Epidemic of 1927. H. D. PEASE, M.D., Pease Laboratories, New York, N. Y.

Judging the Efficiency of the Enforcement of Sanitary Milk Regulations. J. D. BREW, PH.D., Milk Specialist, Bureau of Milk Sanitation, State Department of Health, Albany, N. Y.

PUBLIC HEALTH ENGINEERING AND FOOD, DRUGS AND
NUTRITION SECTIONS*Wednesday Afternoon*

Report of the Committee on Milk and Dairy Products. (Food, Drugs and Nutrition Section.) *Chairman*, WILLIAM B. PALMER, Executive Officer, Milk Inspection Association of the Oranges, Orange, N. J.

Report of the Committee on Milk Supply. (Public Health Engineering Section.) *Chairman*, C. A. HOLMQUIST, Director, Division of Sanitation, State Department of Health, Albany, N. Y.

Milk Sanitation in Canada. R. H. MURRAY, Director, Division of Sanitation, Department of Public Health, Regina, Sask.

Discussion. L. C. FRANK, Office of Milk Investigations, U. S. Public Health Service, Washington, D. C.

Sanitary Regulation of Canneries. E. L. FILBY, Chief Engineer, Bureau of Engineering, State Board of Health, Jacksonville, Fla.

Ice Cream Sanitation and Control. F. W. FABIAN, PH.D., Associate Professor of Bacteriology, Michigan State College, East Lansing, Mich.

Import Milk Control Methods. H. B. SWITZER, Chief, Rouses Point Import Milk Inspection Station, U. S. Department of Agriculture, Rouses Point, N. Y.

VITAL STATISTICS AND EPIDEMIOLOGY SECTIONS

Wednesday Afternoon

Tuberculosis in the Negro in Rural Tennessee. E. L. BISHOP, M.D., State Commissioner of Health, and associates of the State Department of Health, Nashville, Tenn.

The Incidence of Tuberculosis in the Industrial Population. LOUIS I. DUBLIN, PH.D., Statistician, Metropolitan Life Insurance Company, New York, N. Y.

Tuberculosis in Young Females. W. J. V. DEACON, M.D., Director, Bureau of Records and Statistics, Department of Health, Lansing, Mich.

Trend of Tuberculosis in Massachusetts as Illustrated by the Three Dimensional Graph. G. SMILLIE, M.D., and W. F. WELLS, School of Public Health, Harvard University, Boston, Mass.

SECTION SESSIONS

LABORATORY

First Session—Monday Morning

Report of the Committee on Standard Methods. (Recommendations for the Seventh Edition of *Standard Methods of Water Analysis*.) *Secretary*, JOHN F. NORTON, PH.D., Department of Health Laboratories, Detroit, Mich.

Laboratory Methods Used in the Official Control of Milk Supplies.

ROBERT S. BREED, PH.D., and CARL S. PETERSON, PH.D., New York State Agricultural Experiment Station, Geneva, N. Y.

Results on Cold Clarification with Reference to Bacterial and Chemical Changes in Milk. N. E. LAZARUS, President, Lacteal Analytical Laboratories, Buffalo, N. Y.

The Interpretation of Direct Colon-Aerogenes Counts in Well Waters. FRED O. TONNEY, M.D., and RALPH E. NOBLE, Department of Health, Chicago, Ill.

Some Experimental Evidence Concerning the Interpretation of Laboratory Findings in Rural Water Supplies of the Appalachian Area. EDMUND K. KLINE, DR.P.H., Cattaraugus County Department of Health Laboratory, Olean, N. Y.

Monilias, Yeasts and Cryptococci, Their Pathogenicity, Classification and Identification. RHODA W. BENHAM, PH.D., Laboratory for Medical Mycology of the Department of Dermatology, College of Physicians and Surgeons, Columbia University, New York, N. Y.

Minimal "Chlorine Death Points" of Pathogenic Fungi. GERALD HOEFT and JOHN L. WHITE, M.D., Bureau of Laboratories and Research, Department of Health, Chicago, Ill.

The Identification of Certain Yeast-like Fungi Pathogenic for Man. W. D. STOVALL, M.D., and ANNA BUBOLZ, State Laboratory of Hygiene, Madison, Wis.

Some Factors Influencing the Growth and Morphology of *Corynebacterium Diphtheriae* in Throat Cultures. ROSS L. LAYBOURN, Laboratories of State Board of Health, Jefferson City, Mo.

The Preparation of Stabilized Schick Test Toxin. P. J. MOLONEY, PH.D., and E. M. TAYLOR, PH.D., Connaught Laboratories, University of Toronto, Toronto, Ont.

Second Session—Thursday Afternoon

Observations on the Etiology of Epidemic Influenza. I. S. FALK, PH.D., Washington, D. C.

The Cancer Situation as It Affects the Public Health Laboratory, with Demonstration of Actual Living and Growing Human Cancer Cells. JOSEPH COLT BLOODGOOD, M.D., Clinical Professor of Surgery, Johns Hopkins University, Baltimore, Md.

The Coli-Aerogenes Determination in Pasteurization Control. M. H. MCCRADY, Chief of Laboratories, Provincial Bureau of Health, Montreal, Que.

Eberthella Paratyphosa as a Causative Agent of Diarrheal Disease in Connecticut. HENRY WELCH, PH.D., and FRIEND LEE MICKLE, Bureau of Laboratories, State Department of Health, Hartford, Conn.

Correlated Carbohydrate and Serologic Variations in the Morgan's Bacillus Group. L. C. HAVENS, M.D., and ANNE G. IRWIN, State Board of Health, Montgomery, Ala.

Studies on the Self-Disinfecting Power of the Skin. JOHN F. NORTON, PH.D., and MARGUERITE F. NOVY, Department of Health Laboratories, Detroit, Mich.

Food Poisoning Due to Toxic Substances Formed by Strains of the Cloacae-Aerogenes Group. RUTH GILBERT, M.D., MARION B. COLEMAN and ALICE B. LAVIANO, Division of Laboratories and Research, State Department of Health, Albany, N. Y.

Action of Some Common Disinfectants on Phagocytes in Vivo. E. MEGRAIL, M.D., and D. J. SHAW, Department of Hygiene and Bacteriology, School of Medicine, Western Reserve University, Cleveland, O.

The Effect of Scarlatinal Toxin on Chinchilla Rabbits. FRIEDA H. FRASER, Research Associate, Connaught Laboratories, University of Toronto, Toronto, Ont.

(For joint session see page 906.)

HEALTH OFFICERS

First Session—Monday Afternoon

Evaluation of Diphtheria Prevention Work. EDWARD S. GODFREY, JR., M.D., State Department of Health, Albany, N. Y.

Discussion. W. W. BAUER, M.D., Commissioner of Health, Racine, Wis.

Observation or Control of Communicable Diseases. HOWARD A. STREETER, M.D., City Isolation Hospital, Manchester, N. H.

Discussion. JOSEPH SMITH, M.D., Department of Health, Providence, R. I.

Tuberculosis Control Without Hospitalization. C. H. KIBBEY, M.D., Director of Sanitation, Tennessee Coal, Iron and Railroad Company, Fairfield, Ala.

Discussion. M. W. GLASGOW, M.D., Fairfield, Ala.

What the Nurse Expects (or Would Like to Expect) of Her Chief, the Health Officer. AGNES J. MARTIN, R.N., Director of Nurses, Department of Health, Syracuse, N. Y.

Discussion. H. J. KNAPP, M.D., Health Officer, Cleveland, O.

Second Session—Wednesday Afternoon

Discussion of the Recommendations of the Committee on Business Management.* *Chairman,* GEORGE C. RUHLAND, M.D., Commissioner of Health, Syracuse, N. Y.

* Mimeographed copies of the Report will be distributed to members of the Section.

Evolution of Public Health Administration. PETER H. BRYCE, M.D.,
Ottawa, Ont.

What Should a Health Department Be Doing About Cancer?
CLARENCE C. LITTLE, Sc.D., Managing Director, American Society for
the Control of Cancer, New York, N. Y.

Discussion. GEORGE H. BIGELOW, M.D., State Health Commissioner,
Boston, Mass.

What Should a Health Department Be Doing About Accidental
Deaths? LOUIS I. DUBLIN, PH.D., Statistician, Metropolitan Life In-
surance Company, New York, N. Y.

What Should a Health Department Be Doing About Mental Hy-
giene? EDGAR VAN NORMAN EMLERY, M.D., Yale Medical School, New
Haven, Conn.

Discussion. A. GRANT FLEMING, M.D., Professor of Public Health and
Preventive Medicine, McGill University, Montreal, Que.

Joint Dinner—Wednesday

Health Officers Section.

Child Hygiene Section.

American Association of School Physicians.

International Society of Medical Health Officers.

(For joint session see page 906.)

VITAL STATISTICS

First Session—Monday Morning

Report of the Committee on Registration Affairs. *Chairman*, T. F.
MURPHY, M.D., Chief Statistician for Vital Statistics, Bureau of the
Census, Washington, D. C.

Seasonal Incidence of Whooping Cough in the United States.
GAIUS E. HARMON, M.D., Department of Hygiene and Bacteriology,
School of Medicine, Western Reserve University, Cleveland, O.

Have We Still a Smallpox Menace? GEORGE H. VAN BUREN, Super-
visor, Statistical Bureau, Metropolitan Life Insurance Company, New
York, N. Y.

Report of the Committee on Proper Allocation of Records. *Chair-
man*, J. V. DEPORTE, PH.D., Director, Division of Vital Statistics,
State Department of Health, Albany, N. Y.

Vital Statistics in the Development of Neighborhood Health Cen-
ters in New York City. GODIAS J. DROLET, Consulting Statistician,
Committee on Neighborhood Health Development, and LOUIS WEINER,
Vital Statistician, Department of Health, New York, N. Y.

Discussion. CHARLES F. WILINSKY, M.D., Deputy Commissioner, Child
Hygiene Division, Department of Health, Boston, Mass.

Basic Records for Use in a County Health Department. JOHN COLLINSON, M.D., DR.P.H., Chief, Bureau of Vital Statistics, State Department of Health, Baltimore, Md.

Report of the Committee on Coöperation with National Safety Council in Preparing Forms for Additional Information Regarding Accidents. *Acting Chairman*, E. W. KOPF, Metropolitan Life Insurance Company, New York, N. Y.

Second Session—Tuesday Afternoon

SYMPOSIUM ON VITAL STATISTICS REGISTRATION PROBLEMS

Third Session—Thursday Morning

Morbidity from Heart Disease in the State of New York (Exclusive of New York City). J. V. DEPORTE, PH.D., Director, Division of Vital Statistics, State Department of Health, Albany, N. Y.

Report of the Committee on Registration of Births of Illegitimate and Adopted Children. *Acting Chairman*, SHELDON L. HOWARD, State Registrar of Vital Statistics, State Department of Health, Springfield, Ill.

Report of the Committee on Public Health Climatology. *Chairman*, E. W. KOPF, Metropolitan Life Insurance Company, New York, N. Y.

A Study of Heart Disease in Continuation School Boys, Statistics, Comparative Statistics, Clinical Signs, etc. JEROME MEYERS, M.D., Department of Health, New York, N. Y.

Discussion. ELWOOD S. MORTON, M.D., Chief, Bureau of Industrial and Adult Hygiene, Department of Health, New York, N. Y.

An Analysis of the Birth Statistics of the State of New York for a Period of Ten Years. ELIZABETH PARKHURST, State Department of Health, Albany, N. Y.

Report of the Committee on Forms and Methods of Statistical Practice. *Chairman*, A. W. HEDRICH, Sc.D., Associate in Biostatistics, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

A Study in Maternal Mortality. E. S. MACPHAIL, Chief, Division of Census and Vital Statistics, Dominion Bureau of Statistics, Ottawa, Ont.

Mortality by Census Tracts in Cincinnati for 1930. FLOYD P. ALLEN, M.D., Secretary, The Heart Council of Greater Cincinnati, Cincinnati, O.

(For joint session see page 907.)

PUBLIC HEALTH ENGINEERING

First Session—Tuesday Morning

The Cost of Sanitary Surveys of Streams. W. L. STEVENSON, Chief Engineer, State Department of Health, Harrisburg, Pa.

Discussion.

Report of the Committee on Waterways Pollution. *Chairman*, EARNEST BOYCE, Director and Chief Engineer, Division of Sanitation, State Board of Health, Lawrence, Kans.

The Sanitary Inspector in Rural Sanitation. H. W. VAN HOVENBERG, Sanitary Engineer, St. Louis Southwestern Railway Company, Texarkana, Tex.

Discussion. W. F. DRAPER, M.D., Assistant Surgeon-General, U. S. Public Health Service, Washington, D. C.

Report of the Committee on Rural Sanitation. *Chairman*, H. B. HOMMON, Sanitary Engineer, U. S. Public Health Service, San Francisco, Calif. (To be presented by title only.)

Town Planning and Housing in Canada. F. A. DALLYN, Consulting Public Health and Municipal Engineer, Toronto, Ont.

Discussion.

Report of the Committee on Environmental Sanitation. *Chairman*, G. W. PUTNAM, Director of Research, Creamery Package Manufacturing Company, Chicago, Ill. (To be presented by title only.)

Modern Housing and Sanitation. J. H. FINK, Secretary, Housing Committee, Bureau of Charities, Brooklyn, N. Y.

Joint Dinner—Wednesday

Public Health Engineering Section and Conference of State Sanitary Engineers. Annual Engineers' Stag Dinner Party.

Second Session—Thursday Morning

SYMPOSIUM ON DROUGHT

Drought and Health. No author.

Effect of Drought on Water Supplies. E. S. TISDALE, Director, Division of Sanitary Engineering, State Department of Health, Charleston, W. Va.

Discussion. H. E. MOSES, Assistant Chief Engineer, Department of Health, Harrisburg, Pa.

The Effect of Sewage on Water Supplies During Times of Drought. No author.

An Epidemiological Study of Water-Borne Enteritis. M. V. VELDEE, M.D., Surgeon, U. S. Public Health Service, Washington, D. C.

Discussion. LLOYD ARNOLD, M.D., Department of Pathology and Bacteriology, College of Medicine, University of Illinois, Chicago, Ill.

Teaching Engineers Public Health. PROFESSOR SAMUEL C. PRESCOTT, Department of Biology and Public Health, Massachusetts Institute of Technology, Cambridge, Mass.

Discussion. PROFESSOR E. B. PHELPS, College of Physicians and Surgeons, Columbia University, New York, N. Y.

Report of the Committee on Education and Training. *Chairman*, ABEL WOLMAN, Chief Engineer, State Department of Health, Baltimore, Md.

Third Session—Thursday Afternoon

Contamination of Water Mains by Jute Packing. C. H. SPAULDING, Superintendent of Water Purification, Springfield, Ill.

Report of the Committee on Water Supply. *Chairman*, J. R. BAYLIS, Engineer, Bureau of Engineering, Department of Public Works, Chicago, Ill.

Report of the Sub-Committee on Ground Water of the Committee on Water Supply. *Sub-Chairman*, W. S. JOHNSON, Chief Public Health Engineer, State Board of Health, Jefferson City, Mo. (To be presented by title only.)

The Montreal Water Supply. C. J. DES BAILLETS, Chief Engineer, Montreal Water Board, Montreal, Que.

Report of the Committee on Disaster Relief. *Chairman*, E. L. FILBY, Chief Engineer, State Board of Health, Jacksonville, Fla. (To be presented by title only.)

Report of the Committee on Industrial Plant Sanitation. *Chairman*, F. GARDNER LEGG, JR., Sanitary Engineer, Department of Health, Detroit, Mich. (To be presented by title only.)

Report of the Committee on Record Forms. *Chairman*, I. W. MENDELSON, Sanitary Engineer, Washington, D. C.

Discussion. JOEL I. CONNOLLY, Chief Sanitary Engineer, Department of Health, Chicago, Ill.

Report of the Committee on Sewage Disposal. *Chairman*, LANGDON PEARSE, Sanitary Engineer, Sanitary District of Chicago, Chicago, Ill.

Section Business.

(For joint session see page 907.)

INDUSTRIAL HYGIENE

First Session—Monday Afternoon

Presiding: L. R. THOMPSON, M.D., *Chairman*, Industrial Hygiene Section.

Trends and Opportunities in Industrial Hygiene. L. R. THOMPSON, M.D., Assistant Surgeon General, U. S. Public Health Service, Washington, D. C.

Endocrin Dysfunctions Among Industrial Workers. VOLNEY S. CHENEY, M.D., Armour and Company, Chicago, Ill.

Discussion.

Relative Pneumonia Fatality Among Surface Workers and Miners.
C. H. KIBBEY, M.D., Director of Sanitation, Tennessee Coal, Iron &
Railroad Company, Fairfield, Ala.

Discussion.

Prevalence of Respiratory Diseases Among Employees, with Refer-
ence to Age, Sex and Occupation. MICHAEL LAKE, M.D., R. H.
Macy and Company, New York, N. Y.

Discussion.

Section Business.

INDUSTRIAL HYGIENE SECTION COMMITTEE REPORTS

The following Committees will make reports to the Section Council.
Mimeographed copies of these reports will be available to all those in
attendance.

Committee on Standard Practices in the Problem of Compensation
of Occupational Diseases. *Chairman*, HENRY H. KESSLER, M.D.,
State Department of Labor, Newark, N. J.

Committee on Lead Poisoning. *Chairman*, EMERY R. HAYHURST,
M.D., State Department of Health, Columbus, O.

Committee on Pneumoconiosis. *Chairman*, R. R. SAYERS, M.D.,
U. S. Bureau of Mines, Washington, D. C.

Second Session—Tuesday Morning

The Toxicity of Methyl Alcohol. HENRY FIELD SMYTH, M.D., Uni-
versity of Pennsylvania, Philadelphia, Pa.

Discussion.

Silicosis in the Abrasive Powder Industry. HENRY H. KESSLER,
M.D., State Department of Labor, Newark, N. J.

Discussion.

The Advance Program of Industrial Hygiene in New York State.
GEORGE M. PRICE, M.D., New York State Department of Health, New
York, N. Y.

Discussion.

Old Age Security Work. LUTHER GULICK, PH.D., Director, National
Institute of Public Administration, New York, N. Y.

Discussion.

Section Council Meeting.

Dinner in honor of Dr. Alice Hamilton—Tuesday

Presiding: ANTHONY J. LANZA, M.D., Medical Consultant, General Motors
Corporation, New York, N. Y.

Alice Hamilton the Industrial Hygienist. C.-E. A. WINSLOW,
DR.P.H., Yale University, New Haven, Conn.

My Years in Industrial Hygiene. ALICE HAMILTON, M.D., Assistant Professor, Industrial Medicine, Harvard School of Public Health, Boston, Mass.

Third Session—Wednesday Morning

Work Environment as a Factor in General Health of Workers. BERNARD J. NEWMAN, Managing Director, Philadelphia Housing Association, Philadelphia, Pa.

Discussion.

Medical Services of the Bell Telephone Company of Canada. A. R. PENNOYER, M.D., Medical Director, The Bell Telephone Company of Canada, Montreal, Que.

Discussion.

Compensation for Silicosis. J. G. CUNNINGHAM, M.B., Director, Division of Industrial Hygiene, Department of Health, Toronto, Ont.

Discussion. T. N. DEAN, Statistician, Workman's Compensation Board, Toronto, Ont.

Physical Impairment Among One Thousand Negro Workers. FLOYD P. ALLEN, M.D., Secretary, The Heart Council of Greater Cincinnati, Cincinnati, O.

Discussion.

Section Council Meeting.

FOOD, DRUGS AND NUTRITION

First Session—Monday Afternoon

A Basis of Rationing Federal Prisoners. PAUL E. HOWE, PH.D., Senior Biological Chemist in charge Nutrition Investigations, Bureau of Animal Industry, U. S. Department of Agriculture, and A. H. MACCORMICK, Assistant Director, Bureau of Prisons, U. S. Department of Justice, Washington, D. C.

Public Health Aspects of Frozen Foods. CARL R. FELLERS, PH.D., Research Professor, Horticultural Manufactures, Massachusetts State College, Amherst, Mass.

A Health Aspect of Frozen Vegetables. L. H. JAMES, PH.D., and R. P. STRAKA, Food Research Division, Bureau of Chemistry and Soils, U. S. Department of Agriculture, Washington, D. C.

Report of Committee on Fish and Shell Fish. *Chairman,* A. C. HUNTER, PH.D., In charge, Bacteriological Unit, Food Control Laboratory, Food and Drug Administration, U. S. Department of Agriculture, Washington, D. C.

Are Chromates Poisonous? M. J. PRUCHA, PH.D., Professor of Dairy Bacteriology, Agricultural Experiment Station, University of Illinois, Urbana, Ill.

Report of Committee on Cereals and Their Products. *Chairman,* F. C. BLANCK, PH.D., Food Research Division, U. S. Bureau of Chemistry and Soils, Washington, D. C.

Second Session—Tuesday Morning

Report of the Committee on Sanitary Regulations of Public Eating Places. *Chairman*, J. H. SHRADER, PH.D., Research Laboratories, National Dairy Products Corporation, Baltimore, Md.

The Principles and Practice of Health through Anabolic Nutrition. FRANCIS LOWELL BURNETT, M.D., Massachusetts General and Peter Brigham Hospital, Boston, Mass.

Report of the Committee on Nutritional Problems. *Chairman*, PROFESSOR HENRY C. SHERMAN, Department of Chemistry, Columbia University, New York, N. Y.

The Effect of Lead Arsenate Spray on the Composition and Vitamin Content of Oranges. E. M. NELSON, PH.D., and H. H. MORTEN, Bureau of Chemistry and Soils, U. S. Department of Agriculture, Washington, D. C.

Report of the Committee on Meat and Meat Products. *Chairman*, PAUL E. HOWE, PH.D., Senior Biological Chemist in charge Nutrition Investigations, Bureau of Animal Industry, U. S. Department of Agriculture, Washington, D. C.

Report of the Committee on Fruits and Vegetables. *Chairman*, WALTER H. EDDY, PH.D., Teachers College, Columbia University, New York, N. Y.

Luncheon Session—Tuesday

Section Business.

(For joint sessions see pages 906 and 907.)

CHILD HYGIENE

First Session—Tuesday Afternoon

PUBLIC HEALTH AIMS AND PROFESSIONAL SERVICES DURING INFANCY, PRESCHOOL AND SCHOOL AGES

Medical. HELEN MACMURCHY, M.D., Chief, Division of Child Welfare, Department of Pensions and National Health, Ottawa, Ont.

Nursing. HORTENSE HILBERT, R.N., Staff Associate on Nursing, American Child Health Association, New York, N. Y.

Dental. ALFRED WALKER, D.D.S., The Murry and Leonie Guggenheim Dental Clinic, New York, N. Y.

Discussion.

ADMINISTRATION—ROUND TABLE

Rural and Town.

Administrator. ANNA RUDE, M.D., Director, Bureau of Maternal and Child Hygiene, Los Angeles County Health Department, Los Angeles, Calif.

Pediatrician. J. H. MASON KNOX, M.D., Chief, Bureau of Child Hygiene, State Department of Health, Baltimore, Md.

Nurse. ANNA HEISLER, R.N., Professor of Public Health Nursing, Washington University, St. Louis, Mo.

Dentist. HARRY S. THOMSON, D.M.D., Field Secretary, Canadian Dental Hygiene Council, Toronto, Ont.

Medium City.

Administrator. GEORGE C. RUHLAND, M.D., Commissioner of Health, Syracuse, N. Y.

Pediatrician. W. W. BAUER, M.D., Commissioner of Health, Racine, Wis.

Dentist. GEORGE H. WANDEL, D.D.S., Supervisor, Bureau of Dental Health Education, American Dental Association, Chicago, Ill.

Large City.

Administrator. HERMAN N. BUNDESEN, M.D., Commissioner of Health, Chicago, Ill.

Nurse. ESTHER M. BEITH, Executive Director, Child Welfare Association, Montreal, Que.

Specialists:

Nutrition. LUCY H. GILLET, Superintendent, Nutrition Bureau, Association for Improving the Condition of the Poor, New York, N. Y.

Recreation. A. S. LAMB, M.D., Director, Department of Physical Education, McGill University, Montreal, Que.

Luncheon Session—Wednesday

Second Session—Thursday Afternoon

EDUCATION AND TRAINING OF PERSONNEL FOR CHILD HEALTH WORK

What Should Be Taught and How.

General Considerations Including Personal Qualifications. ELIZABETH M. GARDINER, M.D., Director, Division of Maternity and Child Hygiene, State Department of Health, Albany, N. Y.

Administrative. JOHN A. FERRELL, M.D., D.P.H., Associate Director, International Health Division, Rockefeller Foundation, New York, N. Y.

Medical. J. H. MASON KNOX, M.D., Chief, Bureau of Child Hygiene, State Department of Health, Baltimore, Md.

Nursing. HELEN CHESLEY PECK, R.N., Executive Secretary, Infant Welfare Society, Minneapolis, Minn.

Dental. No author.

Social Aspects. No author.

Discussion.

What Is Being Taught and Where (Survey).

Graduate Courses Available (Public Health Schools).

For Physicians. Theory and Practice. No author.

For Nurses. Theory and Practice. MARION G. HOWELL, R.N., Director, School of Applied Social Sciences, Western Reserve University, Cleveland, O.

Staff Education (Survey).

For Physicians. Theory and Practice. WALTER S. CORNELL, M.D., Director, Medical Inspection of Public Schools, Philadelphia, Pa.

For Nurses. Theory and Practice. ELIZABETH FOX, R.N., Director, Visiting Nurse Association, New Haven, Conn.

(For joint session see page 905. For joint dinner see page 910.)

PUBLIC HEALTH EDUCATION

First Session—Tuesday Morning

SCIENTIFIC FACTS FOR PUBLIC CONSUMPTION

Facts from Technical Sections.

Epidemiology. EDWARD S. GODFREY, JR., M.D., Director, Division of Communicable Diseases, State Department of Health, Albany, N. Y.

Child Hygiene. RICHARD A. BOLT, M.D., Director, Cleveland Child Health Association, Cleveland, O.

Food, Drugs and Nutrition. JAMES A. TOBEY, DR.P.H., Director, Health Service, The Borden Company, New York, N. Y.

How May These Facts Be Given to the Public? RAYMOND S. PATTERSON, PH.D., Life Conservation Service, John Hancock Mutual Life Insurance Company, Boston, Mass.

- Dinner Session—Tuesday

Closed session—for members and fellows of the Section only
Section Business.

Second Session—Wednesday Morning

NEWER TOOLS FOR DRAMATIZING HEALTH EDUCATION TO THE GENERAL PUBLIC

New Opportunities in the Use of the Motion Picture. H. E. KLEIN-SCHMIDT, M.D., Director, Health Education Service, National Tuberculosis Association, New York, N. Y.

Radio Broadcasting in Health Education. ELIZABETH C. NICKERSON, State Department of Health, Hartford, Conn.

Mass Health Education in America and Europe. HOMER N. CALVER, New York, N. Y., and BERTRAND BROWN, Director, Division of Publications, Milbank Memorial Fund, New York, N. Y.

Luncheon Session—Wednesday

What's On Your Mind? EVART G. ROUTZAHN, Associate Director, Surveys and Exhibits Department, Russell Sage Foundation, New York, N. Y.

Questions and Answers About Popular Health Education.

(For joint session see page 905.)

PUBLIC HEALTH NURSING

*Luncheon Session—Tuesday**First Session—Tuesday Afternoon*

Getting Public Health Needs Across to Appropriating Bodies.

By a Municipal Health Department. HENRY F. VAUGHAN, D.P.H., Commissioner of Health, Detroit, Mich.

By a Rural Nursing Organization. ELIZABETH A. RUSSELL, R.N., Director, Provincial Public Health Nurses, Winnipeg, Man.

By a Community Fund Agency. HELEN V. STEVENS, R.N., Director, Public Health Nursing Association, Pittsburgh, Pa.

Discussion.

Prenatal Nursing in the Province of Quebec. ALICE AHERN, R.N., Assistant Superintendent in Charge of Canadian Service, Metropolitan Life Insurance Company, Ottawa, Ont.

Public Health Nursing Education. LILLIAN HUDSON, R.N., Department of Nursing, Teachers College, Columbia University, New York, N. Y.

(For joint session see page 905.)

EPIDEMIOLOGY SECTION

First Session—Monday Morning

Evidences of Community Protection Against Diphtheria through Use of Toxoid. WILLIAM WARWICK, M.D., D.P.H., District Medical Officer of Health, St. John, N. B.

The Epidemiology of Scarlet Fever in Relation to Sinus Infection. A. CLEMENT SILVERMAN, M.D., Department of Health, Syracuse, N. Y.

A Milk-borne Typhoid Outbreak at Lincoln, Concord and Weston, Mass. M. J. ROSENAU, M.D., Harvard Medical School, Boston, Mass.

An Epidemiological Study of Amebiasis. From State Department of Health, Nashville, Tenn.

Typhoid Fever in Knoxville. WILLIAM H. ENNEIS, M.D., Bureau of Health, Knoxville, Tenn., and D. F. MILAM, State Department of Health, Nashville, Tenn.

Typhoid Fever in Richmond, Virginia. ALLEN W. FREEMAN, M.D., Professor of Public Health Administration, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

Current Estimation of the Population Susceptible to Measles. A. W. HEDRICH, Sc.D., School of Hygiene and Public Health, Johns Hopkins University, Baltimore, Md.

Epidemiological Practice through the Services of the Medical Practitioner. F. C. MIDDLETON, M.D., Deputy Minister, Department of Health, Regina, Sask.

(For joint sessions see pages 906 and 907.)

MEETINGS OF OTHER ORGANIZATIONS

AMERICAN ASSOCIATION OF SCHOOL PHYSICIANS

First Session—Monday—2 P.M.

Presiding, SVEN R. LOKRANTZ, M.D., President, American Association of School Physicians, Los Angeles, Calif.

Addresses of Welcome:

HIS WORSHIP CAMILLIEN HOUE, Mayor of Montreal.

WILLIAM C. HASSLER, M.D., President Elect, American Public Health Association, Health Officer, San Francisco, Calif.

Presidential Address. SVEN LOKRANTZ, M.D., Los Angeles, Calif.

The School Physician and the School Program. JOHN SUNDWALL, M.D., University of Michigan, Ann Arbor, Mich.

Medical Direction of All School Health Service. JOHN E. BURKE, M.D., Schenectady, N. Y.

No Title. ARNOLD H. KEGEL, M.D., Chicago, Ill.

Second Session—Tuesday—9.30 A.M.

Presiding, SVEN R. LOKRANTZ, M.D.

The Early Recognition of Cardiopathic Conditions in Children of School Age. ROBERT H. HALSEY, M.D., New York, N. Y.

The Incidence of Heart Disease Among Children of School Age. J. V. DEPORTE, M.D., Albany, N. Y.

Preventive and Remedial Measures in Heart Diseases of Children. LAURA B. BENNETT, M.D., Los Angeles, Calif.

Luncheon Session—Tuesday—12.30 P.M.

Presiding, SVEN R. LOKRANTZ, M.D.

Business Session—Tuesday Evening—8 P.M.

Presiding, SVEN R. LOKRANTZ, M.D.

Report of Officers.

Report of Committees.

Election of Officers.

Miscellaneous.

Third Session—Wednesday—9:30 A.M.

Presiding, S. BOUCHER, M.D., D.P.H., Director, Department of Health, Montreal, Que.

Natural and Acquired Posture. JAMES F. ROGERS, M.D., U. S. Bureau of Education, Washington, D. C.

The Recognition and Management of Tuberculosis of Childhood. HENRY D. CHADWICK, M.D., Detroit, Mich.

Tuberculosis Illustrated. STEPHEN A. DOUGLASS, M.D., Valley View Sanitarium, Paterson, N. J.

The Need for Promoting Interest in Convalescent Care. E. H. LEWINSKI CORWIN, M.D., Academy of Medicine, New York, N. Y.

Securing Results in Mouth Hygiene. HARRIS R. C. WILSON, D.D.S., Cleveland, O.

Fourth Session—Thursday—9.30 A.M.

Presiding, EDWARD PERCEY LEWIS, M.D., University of Toronto, Toronto, Ont.

Abnormal Behavior in the Adolescent from the Viewpoint of Endocrinology. WALTER TIMME, M.D., New York, N. Y.

The Hurried, Worried High and Junior High School Girl. A. L. BRANNACK, M.D., Pontiac, Mich.

The Psychological Factor in the Medical Examination of School Children. CATHERINE BRANNICK, M.D., Chicago, Ill.

The Relation of the Psychiatrist to the School Physician. FREDERICK L. PATRY, M.D., Albany, N. Y.

Fifth Session—Thursday—2 P.M.

Presiding, A. GRANT FLEMING, M.D., Professor of Public Health and Preventive Medicine, McGill University, Montreal, Que.

County and Rural Health Service.

In Canada. L. R. VEZINA, M.D., St. Jerome, Que.

In South Dakota. MARGARET W. KOENIG, M.D., Huron, S. Dak.

In Montgomery County, New York. ORRA A. PHELPS, M.D., Fort Plain, N. Y.

In Oakland County, Michigan. JOHN D. MONROE, M.D., Pontiac, Mich.

In Cattaraugus County, New York. CLARENCE A. GREENLEAF, M.D., Olean, N. Y.

The Integration of Health Agencies for the Health of the School Child. FRANCIS H. BARBOUR, Mineola, N. Y.

(For joint dinner see page 910.)

CONFERENCE OF STATE SANITARY ENGINEERS

All day Saturday and all day Monday. Annual Engineers' Stag Dinner Party, Wednesday evening.

ASSOCIATION OF WOMEN IN PUBLIC HEALTH

Dinner. Monday evening.

CONFERENCE OF STATE LABORATORY DIRECTORS

(Limited to Directors of State and Provincial Laboratories, Branch Laboratories and their Chief Assistants.)

Luncheon Session. Tuesday.

Afternoon Session. Tuesday.

INTERNATIONAL ASSOCIATION OF DAIRY AND MILK
INSPECTORS

Thursday, Friday, and Saturday, September 10, 11, and 12.

AMERICAN SOCIAL HYGIENE ASSOCIATION AND THE
CANADIAN SOCIAL HYGIENE COUNCIL

Wednesday. One day Social Hygiene Institute.

INTERNATIONAL SOCIETY OF MEDICAL HEALTH OFFICERS
Week of September 14.

DELTA OMEGA

Luncheon. Monday.

SYMPOSIUM ON BRITISH PUBLIC HEALTH
ADMINISTRATION

ON Tuesday afternoon a special session on Health Administration in Great Britain will be held. The speakers will be:

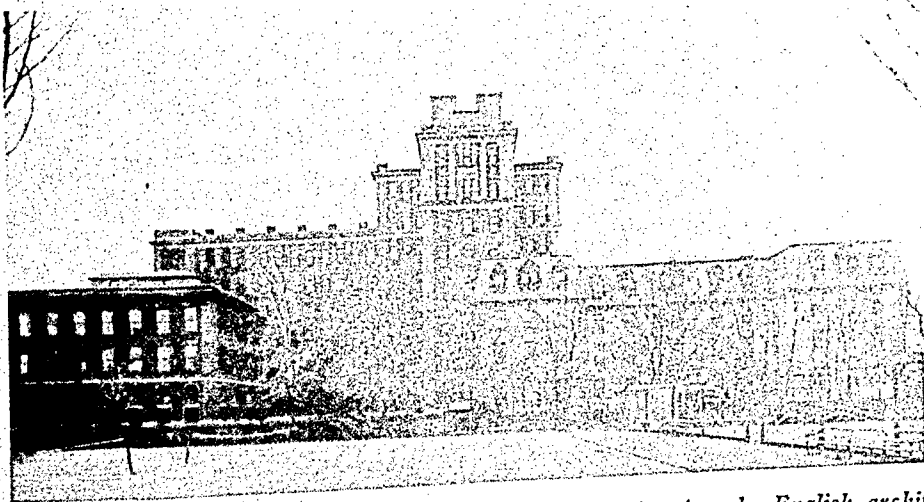
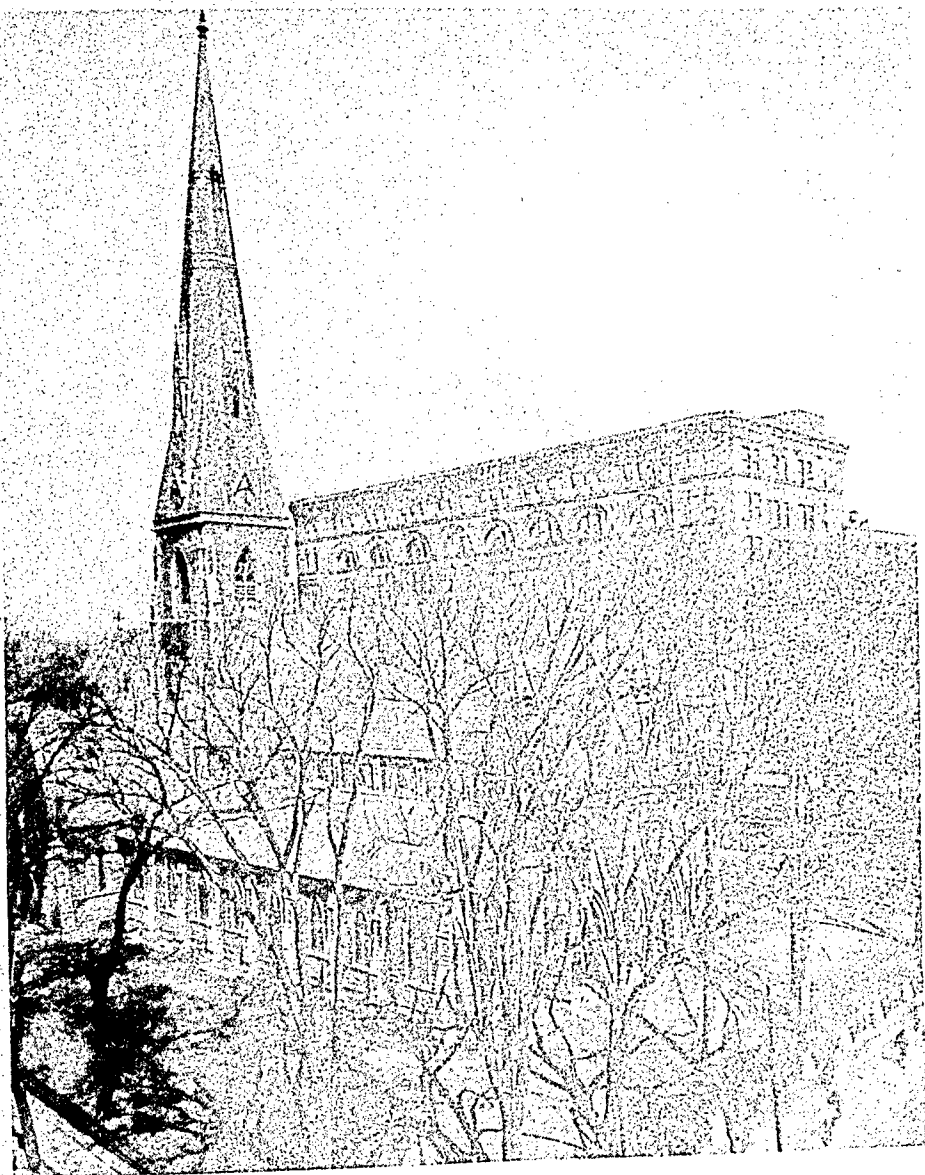
Sir Allan Powell, Chief Public Assistance Officer, London County Council, London

George F. Buchan, M.D., M.R.C.P., D.P.H., Medical Officer of Health, Willesden, London

James Fenton, M.D., D.P.H., Medical Officer of Health, Kensington, London

Charles Porter, M.D., B.Sc., Medical Officer of Health, Marylebone, London

They will discuss trends in British public health administration, education and training of public health workers, maternal and infant health services and hospital administration.



*Upper—Christ Church Cathedral (Anglican), a fine example of early English architecture
Lower—Montreal General Hospital*

INSPECTION TRIPS FOR THE A. P. H. A. CONVENTION MONTREAL, CANADA, SEPTEMBER 14-17, 1931

THEODORE J. LAFRENIERE, F. A. P. H. A.

*Chief Engineer, Provincial Department of Health; and Chairman, Committee on
Inspection Trips of the Local Committee, Montreal, Canada*

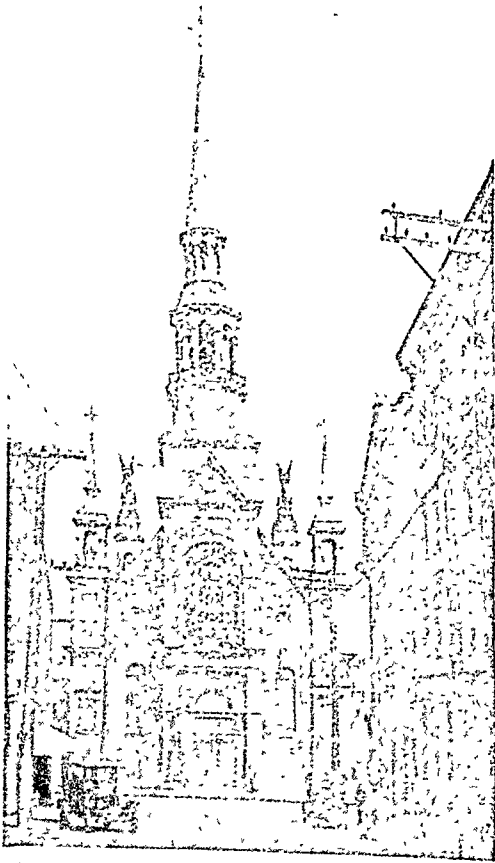
MONTREAL, the metropolis of Canada, offers a wealth of sanitary works, construction projects, hospitals and kindred institutions and industrial plants for inspection trips. The committee in charge has made arrangements for a number of visits which will satisfy every variety of interest in public health work.

It must be remembered that the city

of Montreal is one of the principal historic centers on the continent—it abounds in sites each of which brings to the memory a stirring story of heroism or gallantry. Champ de Mars, Place d'Armes, Jacques Cartier Square—these are places that thousands of tourists come to visit every year. In consequence, the inspection trips will provide a rare opportunity to see in detail historic Montreal, as well as to examine features of particular importance to public health workers.

It may be recalled too that Montreal constitutes a link between the Old World and the New. French is spoken by the great majority of its citizens, and many features brought back from France have been incorporated into the practice of many of the hospitals, health centers and similar institutions. English practice too finds many proponents in this new-old-world city. As a result, a notable combination of French, English, and American methods will be found in the work of practically all the larger medical and public health institutions, a feature which will prove of exceptional interest to workers in similar fields.

One of the main features to be included in the inspection trips is the Municipal Water Filtration Plant with a total capacity of 250 million gallons per day. The plant employs double filtration for part of the supply, a practice unique in water treatment on this side of the Atlantic. The major portion of the city's water is handled by mechanical gravity filters. These two types of filtration, with their various equipment.



Bonsecours, the sailors' church, built in 1771 on site of first church erected in 1657. Dozens of tiny ships holding votive lamps, given in recognition of answered prayers for safety, decorate the interior.

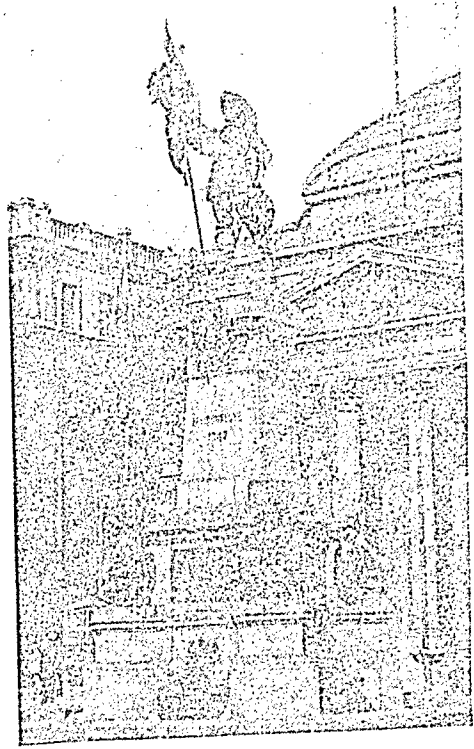
should prove of exceptional interest. Other features of interest to the sanitary engineer will include the construction work in progress on two main sewage collectors of the tunnel type. The novel method of construction used in this work will be well worth inspection. A new incinerator, of the most modern design and just placed in operation, will be visited. And for those interested in milk sanitation engineering, Montreal possesses several modern pasteurization plants, one of which, recently built, is the last word in pasteurization design and equipment.

A variety of municipal health centers, as well as county health units in operation a short distance from the city, may be visited. Here the combination of French and English, as well as American features, with bi-lingual officers and attendants, will be novel to the experience of many in this line of work. It is perhaps not generally appreciated that the Province of Quebec has made amazing progress during the past 5 years in its rapid installation of county health units. No less than 23 such units, to cover 29 counties, have been organized in this short period. A visit to one of these units will show the manner in which the Province hopes to solve its rural health problem.

The laboratory worker will doubtless be interested in the Provincial and Municipal Health Laboratories. The former employs a staff of 35 and is provided with an excellent equipment. It made over 100,000 examinations last year.

Montreal possesses a great variety of hospitals and related institutions—some religious, some nondenominational. Of the French hospitals, the Notre-Dame, the Hotel-Dieu, the Ste. Justine Hospital for Children, will prove of particular interest. The large Montreal General Hospital as well as the Royal Victoria and Montreal Children's Hospitals, ideally located on the slopes of Mount Royal, are well worth a visit.

Then there are the Radium Institute, the Sacred Heart Hospital for Tuberculosis and a number of smaller institutions. In addition there are four new hospitals under construction. Some of the larger charitable institutions and asylums, veritable cities in themselves



The statue of Paul Chomedey de Maisonneuve, founder of Montreal, stands on Place d'Armes near the spot where he slew the chief of an invading band of Iroquois.

and truly remarkable in breadth of organization and scope of activities, are of a type rarely encountered in cities on this continent. A beautiful side trip by motor will be arranged, if desired, to the Ste. Agathe Sanatorium for Tuberculosis, situated in the Laurentian Mountains.

Among the industrial plants to be visited which may be of interest are the large sugar refineries and the Fleishmann Yeast Plant. And we may not forget the Frontenac Brewery, a type of plant rather foreign to the experience of many of our neighbors on the other side of the boundary line, but which will prove well worth a visit.

ASSOCIATION NEWS

NOMINATIONS FOR THE GOVERNING COUNCIL

IN accordance with the By-laws of the Association the Nominating Committee reports the following nominations for the Governing Council. The Constitution provides that "upon the petition of twenty-five Fellows, the Nominating Committee shall add the name of any Fellow to this list, providing

such petition is received 15 days before the Annual Meeting."

The ten Fellows receiving the highest number of votes on a written ballot cast by the Fellows present and voting at the Annual Meeting in Montreal will be elected for the three-year term, 1931-1934.

William J. Bell, M.B.,
Deputy Minister of Health,
Toronto, Ont.

Richard A. Bolt, M.D.,
Director, Cleveland Child Health Assn.,
Cleveland, O.

Homer N. Calver,
Asst. Professor of Hygiene,
Univ. & Bellevue Hospital Medical College,
New York University,
New York, N. Y.

Michael M. Davis, Ph.D.,
Julius Rosenwald Fund,
Chicago, Ill.

W. J. V. Deacon, M.D.,
Director, Bureau of Records & Statistics,
State Board of Health,
Lansing, Mich.

Robert D. Defries, M.D.,
Connaught Labs., Univ. of Toronto,
Toronto, Ont.

Harrison P. Eddy,
Consulting Engineer,
Boston, Mass.

W. Brownley Foster, M.D.,
Director of Public Welfare,
Richmond, Va.

Walter S. Frisbie,
U. S. Food, Drug & Insect Control,
Department of Agriculture,
Washington, D. C.

Omer R. Gillette, M.D.,
Health Officer,
Colorado Springs, Colo.

Edward S. Godfrey, Jr., M.D.,
Dir., Division of Communicable Diseases,
State Department of Health,
Albany, N. Y.

Annie W. Goodrich, R.N.,
School of Nursing, Yale University,
New Haven, Conn.

Prof. F. P. Gorham,
Brown University,
Providence, R. I.

Clarence F. Kendall, M.D.,
State Commissioner of Health,
Augusta, Me.

John W. Kerr, M.D.,
U. S. Public Health Service,
Washington, D. C.

W. F. King, M.D.,
State Health Commissioner,
Indianapolis, Ind.

John P. Koehler, M.D.,
Commissioner of Health,
Milwaukee, Wis.

George T. Palmer, D.P.H.,
Director, Division of Research,
American Child Health Association,
New York, N. Y.

George M. Parrish, M.D.,
Health Officer,
Los Angeles, Calif.

Raymond S. Patterson, Ph.D.,
Life Conservation Service,
John Hancock Mutual Insurance Co.,
Boston, Mass.

W. H. Peters, M.D.,
Health Officer,
Cincinnati, O.

John T. Phair, M.B.,
Department of Health,
Toronto, Ont.

Mazÿck P. Ravenel, M.D.,
University of Missouri,
Columbia, Mo.

John L. Rice, M.D.,
Health Officer,
New Haven, Conn.

James Roberts, M.D.,
Medical Officer of Health,
Hamilton, Ont.

William F. Snow, M.D.,
General Director, American Social Hygiene
Assn.,
New York, N. Y.

Henry Field Smyth, M.D.,
Laboratory of Hygiene,
University of Pennsylvania,
Philadelphia, Pa.

Stewart G. Thompson, D.P.H.,
Director, Bureau of Vital Statistics,
State Board of Health,
Jacksonville, Fla.

Robert Spurr Weston,
Consulting Engineer,
Boston, Mass.

Anna W. Williams, M.D.,
Research Laboratory,
Department of Health,
New York, N. Y.

CHARLES V. CRASTER, M.D.,
Chairman,
Nominating Committee.

APPLICANTS FOR FELLOWSHIP

HEALTH OFFICERS' SECTION: Seraphin Boucher, D.P.H., Montreal, Que.; Earle G. Brown, M.D., Topeka, Kansas; Willis N. Butrick, Milford, Conn.; Jay Dee Dunshee, M.D., Pasadena, Calif.; Jesse H. Epperson, Durham, N. C.; Cameron St. Clair Guild, M.D., New York, N. Y.; David E. Smallhorst, M.D., Glendale, Calif.; James Stewart, M.D., Jefferson City, Mo.; William B. Wells, M.D., Riverside, Calif.; William F. Wild, M.D., Bridgeport, Conn.

LABORATORY SECTION: Oscar Costa-Mandry, M.D., San Juan, P.R.; W. T. Cummins, M.D., San Francisco, Calif.; Frederick W. Fabian, Ph.D., East Lansing, Mich.; Donald T. Fraser, M.B., Toronto, Ont.; William D. Frost, Dr.P.H., Madison, Wis.; C. A. Perry, Hurlock, Md.; R. V. Stone, M.D., Los Angeles, Calif.; Arthur N. Tasker, M.D., Fort Lewis, Wash.; Joseph C. Willett, D.V.M., St. Louis, Mo.; Verna Willis, M.S., Jefferson City, Mo.

PUBLIC HEALTH ENGINEERING SECTION: Harold A. Young, Los Angeles, Calif.; Ernest William Steel, C.E., College Station, Tex.

CHILD HYGIENE SECTION: Amos L. Beaghtler,

M.D., Denver, Colo.; Mary Luise Diez, M.D., Boston, Mass.; P. Martin Keller, M.D., Glendale, Calif.; Anastasia Miller, R.N., Sacramento, Calif.; Harry K. Read, M.D., Houston, Tex.

PUBLIC HEALTH EDUCATION SECTION: Edna W. Bailey, Ph.D., Berkeley, Calif.; Mary P. Connolly, Detroit, Mich.; Charles F. Hayes, M.D., Fort Worth, Tex.; Arthur Jordon, M.D., Helena, Mont.; Anne Raymond, New York, N. Y.; James R. Scott, M.D., Albuquerque, N. M.

PUBLIC HEALTH NURSING SECTION: Mrs. Ivah W. Uffelman, Nashville, Tenn.

EPIDEMIOLOGY SECTION: Albert E. Austin, M.D., Sound Beach, Conn.; Jesse H. Crouch, M.D., Helena, Mont.; James A. Doull, M.D., Cleveland, O.; H. W. Hill, M.D., Vancouver, B. C.; A. Clement Silverman, M.D., Syracuse, N. Y.; George M. Stevens, M.D., Los Angeles, Calif.; Ida M. Stevens, Berkeley, Calif.

UNAFFILIATED: John H. Collins, M.D., Schenectady, N. Y.; Frank L. Watkins, M.D., Great Falls, Mont.; Paul L. West, M.D., Wenatchee, Wash.

NEW MEMBERS

The following list includes applicants who have been approved for membership in the A. P. H. A. by the Sub-committee on Eligibility. These new members have requested affiliation with the sections indicated, and action by the Section Council will follow.

Health Officers Section

Margaret W. Barnard, M.D., New York, N. Y.,
Medical Director, Bellevue-Yorkville Health
Demonstration
O. I. Bemis, M.D., Modesto, Calif., Stanislaus
County Health Officer

Dr. Thomas M. Berry, Okmulgee, Okla., Supt.
of Public Health
Edward R. Davies, M.D., Georgetown, Ky.,
Director, Scott County Health Dept.
L. G. Eastman, M.D., Hazen, N. D., Supt. of
Public Health, Mercer County

Francis E. Gibson, Monessen, Pa., City Health Officer

Aurel Goodwin, M.D., Topeka, Kans., City Health Officer

George N. MacDonnell, M.D., Miami, Fla., Chief, Division of Health

T. J. McNally, M.D., London, Ont., District Officer of Health

H. M. Mosdell, M.D., St. John's, Newfoundland, Chairman, Board of Health

Hon. George H. Murphy, M.D., Halifax, N. S., Minister of Public Health

Fred L. Ogilvie, Caruthersville, Mo., Pemiscot County Health Officer

James E. Pendergrass, M.D., Fresno, Calif., Fresno County Health Officer

Laboratory Section

Koji Ando, M.D., New York, N. Y. (Chief, Bacteriological Dept., Hygienic Inst. of S. M. R. Co., Dairen, S. Manchuria, China) (Assoc.)

M. Jacques Archambault, B.A., C.E., Montreal, P. Que., Chemist, Provincial Bureau of Health

M. Jules Archambault, M.D., Montreal, P. Que., Serologist, Provincial Bureau of Health

Antonio Bolduc, M.D., Montreal, P. Que., Bacteriologist, and Supt., Division of Labs, Dept. of Health

Joseph Felsen, M.D., New York, N. Y., Director of Labs and Research, Bronx Hospital

Michael Horti, M.D., Woodhaven, L. I., N. Y. (Assoc.)

Luang Siribaed-bisuddhi, C.P.H., Dr.P.H., Washington, D. C. (temporarily), Director of Public Health Labs., Bangkok, Siam (Assoc.)

Public Health Engineering Section

Samuel D. Macready, Hollywood, Fla., Director of Health and Sanitation

Harvey G. Rogers, Minneapolis, Minn., Sanitary Engineer, State Dept. of Health

Industrial Hygiene Section

Sophie Rabinoff, M.D., New York, N. Y., Bureau of Industrial and Adult Hygiene, Dept. of Health

Child Hygiene Section

Eleanor B. McCarthy, B.S., Boston, Mass., Consultant in Dental Hygiene, State Dept. of Health

J. F. Mosher, M.D., Coeymans, N. Y., School Physician

Public Health Education Section

Louise F. Bell, Pasadena, Calif., Chairman, Committee on Health and Sanitation, Women's Civic League

Frances Daniel, Chicago, Ill., Educational Worker, National Food Bureau (Assoc.)

Edith M. Gates, B.A., New York, N. Y., Director, Health Education, National Board, Y. W. C. A.

Dwight G. W. Hollister, B.B.A., Babson Park, Mass. (Assoc.)

Dr. William D. Moore, San Pedro, Calif., City School Physician (Los Angeles)

Robert L. Nourse, M.D., Boise, Idaho, Public Health Adviser, Dept. of Public Welfare

R. R. Rosell, Chicago, Ill., Educational Worker, National Food Bureau (Assoc.)

Mildred L. Tuttle, R.N., Nashville, Tenn., Instructor, Health Education and Nursing, Peabody College

Public Health Nursing Section

Lalla M. Goggans, R.N., Jacksonville, Fla., Staff Nurse, State Board of Health

Mary Harrigan, R.N., Detroit, Mich., Territorial Supv., Metropolitan Life Ins. Co.

Mrs. Condon W. Taylor, R.N., Nashville, Tenn., Field Nurse, State Dept. of Public Health

Unaffiliated

John M. Flude, M.D., New York, N. Y., Field Representative, American Society for Control of Cancer

DECEASED MEMBERS

George M. Kober, M.D., Washington, D. C., Elected Member 1896, Fellow 1922

Mrs. Herman M. Biggs, New York, N. Y., Elected Member 1926 (Assoc.)

Horace G. Dunham, M.D., Dover, N. J., Elected Member 1926

Edgar B. Kay, Washington, D. C., Elected Member 1928

Anne McFarland Sharpe, M.D., Tallahassee, Fla., Elected Member 1927

Col. Gustave R. Tuska, New York, N. Y., Elected Member 1915

William E. Warren, M.D., Williamston, N. C., Elected Member 1920

Ennion G. Williams, M.D., Richmond, Va., Elected Member 1905

PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Health Survey of Washington—
A study of health and hospital service has been made in Washington, D. C., by the staff of the American Public Health Association with the aid of other agencies. On the basis of the *Appraisal Form*, this city scores 725.6. The effort of the Health Department contributes 73.7 per cent of this total, while 14.8 per cent is due to other official agencies, and 11.5 per cent is due to the efforts of voluntary agencies.

The health department rates 87 per cent in its vital statistical service. There are deficiencies in the analysis and graphic presentation of facts and it is recommended that a trained statistician be employed with suitable personnel and that there be installed mechanical devices for the analysis of data.

All of the acute communicable diseases are well reported with the exception of typhoid fever. The number of children protected against diphtheria is comparatively small but vaccination of school children against smallpox is compulsory. There is need for a continuous and vigorous diphtheria protection campaign. There is also need for additional trained public health nurses to replace medical inspectors who should be used only for diagnostic service.

There is need of effort to increase the reporting of venereal infection and the tracing of sources of infection among clinic cases. There should be a full-time director of the tuberculosis service with an extension of medical, nursing, hospital, and preventive services.

Washington scores 86 per cent in maternal hygiene work but only 66 per cent in infant hygiene, where material increases are needed in medical and nursing personnel.

School health service is a joint function of the Health Department and the Board of Education. The number of medical inspectors, school nurses, and dental inspectors should be increased in order to provide a thorough medical examination of all children entering public school for the first time, and of children in the fifth or sixth grades, and to enable the nurses to encourage the mothers to bring a large number of children with defects to professional attention.

The rating for food and milk control is 87 per cent, while the sanitation activities have the highest rating of any division of the department with a score of 92 per cent.

Funds and personnel should be provided to make possible a popular health instruction bureau in the health department.—*Health and Hospital Survey of Washington, D. C.*, Washington Council of Social Agencies, 1931.

Rural Health in Missouri—Contagion and nutritional deficiencies have increased in the drought areas of Missouri. This is especially true of typhoid fever. Scurvy, pellagra, and rickets have been reported to be more prevalent. Nutritional disturbances may lead to an increase in the prevalence of tuberculosis.

With the coöperation of the U. S. Public Health Service, funds became available in February, 1931, for the establishment of a division of coöperative rural health work in the State Health Department. The plan contemplates the establishment of five rural health districts south of the Missouri River, each under the supervision of a full-time trained district health officer,

assisted by a public health engineer, nurses, and laboratory technicians.—James Stewart, State Health Commissioner, Missouri's Efforts to Protect Health of Rural Inhabitants, *United States Daily*, May 29, 1931.

Examination of Domestic Servants in Newark, N. J.—The Health Department, having successfully required a semiannual examination of food handlers for several years, concluded that it would be possible, and undoubtedly valuable, to extend this work to include a similar requirement for domestic servants where intimate contact with the family is certain. Accordingly, an ordinance was adopted September 1, 1930, requiring a certificate of health from a physician for each domestic servant, indicating that the individual has been found free from tuberculosis or any other communicable disease. The certificate is submitted on blanks supplied by the Newark Health Department and is good for a period of 6 months. Upon receipt of the certificate, the Health Officer issues a food handlers' card. The ordinance further states that any domestic servant desiring to conform to the provisions of the ordinance may be examined by a physician connected with the Newark Health Department without charge.

The law is administered in much the same manner as the food handlers' ordinance with the exception that enforcement is a function of the sanitary rather than the food division of the Health Department. The physical examinations are made by physicians in the tuberculosis division.

During the 8-month period following the adoption of the ordinance, there have been examined 2,196 domestics, of whom 2,107 were females. Of this number, 1,382 were colored and 814

white. There were 1,769 housekeepers and houseworkers, 151 cooks, 25 nurse maids, and 251 in a miscellaneous group. This is considered a fairly satisfactory start as it is realized that the numbers will increase steadily as the public, through constant publicity, becomes familiar with the ordinance. It is understood, of course, that the 25 nurse maids represented but a fraction of the thousands of individuals employed in this type of service. It is the intention of the Health Department to seek wilful offenders and bring them to court with the belief that the subsequent publicity will increase the number of applicants for examination.—Charles V. Craster, Health Officer, Newark, N. J., July, 1931.

Variable Scarlet Fever Quarantine—Following a 5-year study of the incidence of secondary cases in scarlet fever, the Detroit Department of Health has adopted a variable quarantine period for scarlet fever based not only upon the clinical condition of the patient but also upon age and weather. In the past, a simple case of scarlet fever was quarantined for 28 days while the complicated case was held for a maximum of 56 days. The new regulations provide for a 21-day quarantine for patients 15 years of age and over, while children below this age are still held for 28 days. Also, during the warm months of July, August, and September, the quarantine period at all ages is reduced to 21 days, as the infecting case rate during this period has for the past several years been less than 1 per cent. In complicated cases at the end of 28 days the quarantine is removed and a warning placard restricts the case until termination of the period of isolation.—*Weekly Health Review*, Detroit Dept. of Health, June 27, 1931.

LABORATORY

JOHN F. NORTON, PH. D.

A TWO-PHASE AND THREE-PHASE AUTOMATIC INOCULATOR FOR BACTERIOPHAGE WORK

FRED O. TONNEY, M. D., F. A. P. H. A.

Bureau of Laboratories and Research, Department of Health, Chicago, Ill.

THE two types of apparatus described were improvised to avoid the necessity of manual inoculations at night, in obtaining successive generations of young cultures for bacteriophage studies. The smaller device with the single alarm clock provides a second generation culture ready for morning use, and the larger one with the double clock attachment gives a third generation culture.

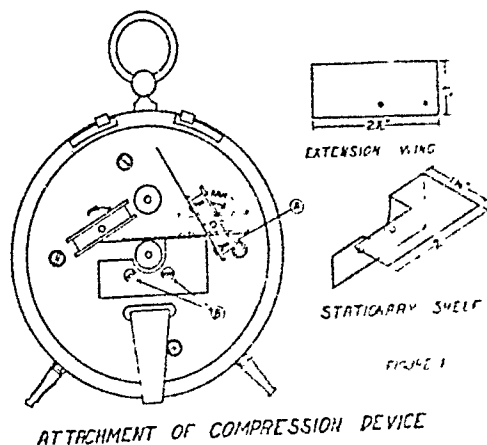
The age of the culture is fixed by setting the alarm hands of the clocks at any time desired. The time gained by having young cultures ready in the morning is often of material aid in the day's work.

The parts required to be sterilized are easily detached at the hose connections. They are made up and prepared a number at a time, cotton plugged at all open ends, wrapped in paper, sterilized and kept ready for use.

PARTS

1. The alarm clock, Figure 1, is of the ordinary type, but should have an alarm spring of ample strength. It is fitted with an extension wing of heavy tin $1\frac{1}{4}$ " wide, attached by screws to the alarm winding stem (a) and a horizontal shelf of tin $1\frac{1}{4}$ " wide screwed to the body of the clock (b). Before this shelf is attached the alarm stem should be wound to its full tension. When in use, the alarm hand is set in the usual way and when the alarm rings the winding stem moves downward until stopped by the horizontal shelf, thus acting as a lever to compress a rubber bulb placed upon the shelf. In purchasing the clock, one having a short

margin time for setting the alarm should be selected.*



2. The inoculating pipette, Figure 2, consists of a combination T tube and U tube of ordinary 6 mm. glass tubing with a rubber bulb (3 to 5 c.c.) on one end and an air vent of rubber tubing compressed by a screw clamp on the projecting arm. The pipette is most simply made from an ordinary T tube by bending one arm to form a shallow U and drawing out the distal end to a tip which is then bent downward at an angle. A small safety bulb may be blown in the tube next to the U if desired.

3. The T tube, Figure 3, of 6 mm. tubing fitted at one end with a larger bulb (5 or 10 c.c.) and an air vent of rubber tubing and screw clamp on the projecting arm.

* To illustrate: If the alarm hand is set at 4 A.M. the alarm lever can usually be moved from the "silent" to the "ringing" position after 4:30 P.M. the previous evening, without tripping the alarm. Some clocks, however, require a margin of as much as two hours in the setting time. The most serviceable clock is one having a time margin of $\frac{1}{2}$ hour or less. A watch-maker can usually readjust the mechanism to give a shorter time margin.

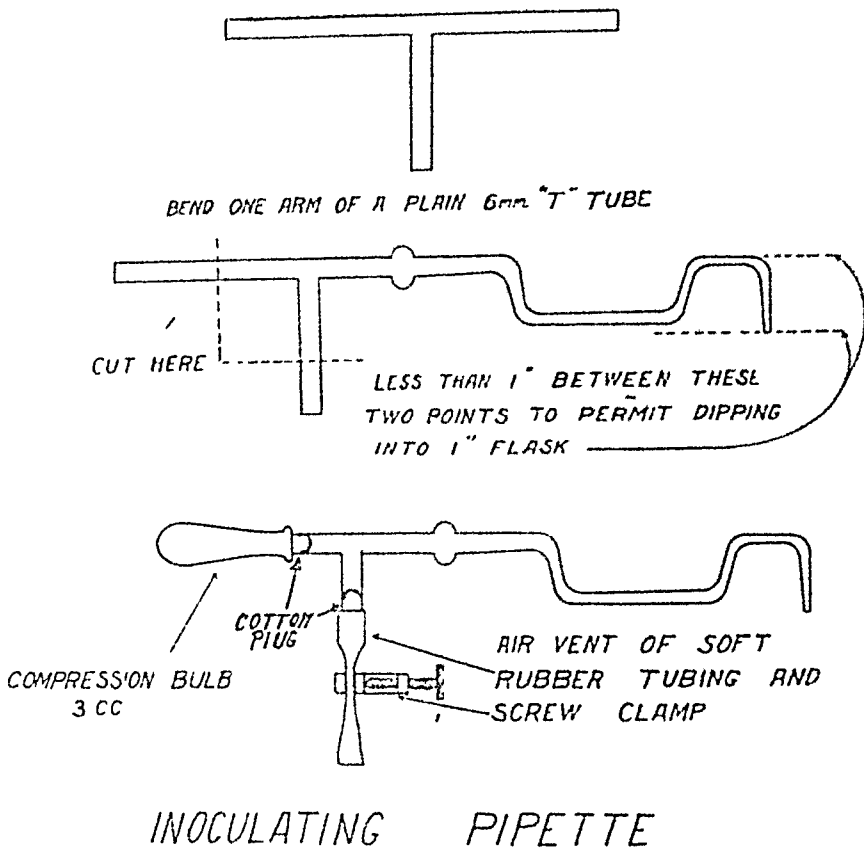


FIGURE 2

4. A standard U tube, Figure 4, of any size desired (a) with side arms. To one arm is connected, by means of rubber tubing, a small delivery tube with a narrowed tip, bent at a right angle (b).

5. Several solid rubber stoppers to fit the standard U tube, Figure 4 (a).

6. A small ring stand, small clamp and clamp holder.

THE SINGLE INOCULATOR

The single device consists of a clock and an inoculating pipette, Figures 1 and 2. The complete assembly is shown in Figure 6.

The steps of the technic of preparation are as follows:

1. Wind the clock and set the alarm hand at the inoculating time desired. Turn alarm lever to "silent."

2. Place clock and all unassembled parts in the incubator for 1 hour to warm; include a small flask of sterile broth to be inoculated at the outset.

3. After warming, unwrap the sterile in-

oculating pipette, attach the bulb and vent, leaving the cotton plugs in the tubes. Open the vent; see Figure 6.

4. Inoculate the warmed flask of broth with a culture of the organism to be used. The mouth of the flask should be wide enough to admit the inoculating pipette (about 1").

5. Dip the inoculating pipette into the flask just inoculated and draw up enough fluid to fill the U, controlling the manipulation by pinching or releasing the opened vent with the fingers. Remove the pipette from the flask to a horizontal position and adjust the fluid in the U tube to the amount desired by again manipulating the bulb and opened vent. In the same way blow out the last drop from the tip.

6. Now flame the tip thoroughly until it is completely dry and sterile inside and out (keep vent open).

7. Insert the sterile tip beside the cotton plug of a second flask of sterile broth (keep vent open).

8. Assemble the outfit in the incubator, placing the bulb between the compression arms of the clock (vent open).

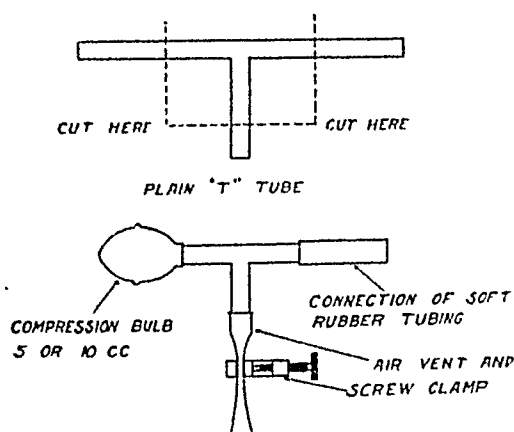
9. Allow the outfit to warm one-half hour;

then set the alarm lever to ring, close vent and leave the apparatus in the incubator over night.

The first phase of growth occurs in the inoculating pipette. When the alarm rings the flask of broth is inoculated from the contents of the pipette and the second phase of growth begins.

THE DOUBLE INOCULATOR

The double device consists of two alarm clocks, Figure 1; one inoculating pipette with bulb and vent, Figure 2;



THE "T" TUBE

FIGURE 3

one plain T tube with bulb and vent, Figure 3; one standard U tube, Figure 4 (a); with delivery tube, (b). The standard U tube is previously filled with broth to about $\frac{1}{2}$ " below the side arms; it is then cotton plugged and sterilized with the delivery tube, Figure 4 (b), in place but protected by a paper wrapping. Just before use, the cotton plug farthest from the delivery tube is replaced by a tightly fitting sterile rubber stopper. Assemble the apparatus as shown in Figure 5.

TECHNIC OF PREPARATION

1. Wind the clocks, set the alarm hands at the desired hours, as 10 P.M. and 4 A.M. Turn the alarm levers to "silent."

2. Place both clocks and all the unassembled parts in the incubator for about an hour to warm. Include also a small flask of sterile broth to be inoculated at the outset (g).

3. After warming, fasten the standard U tube (a) of sterile broth rigidly to a small ring stand by means of an adjustable clamp and clamp holder. Turn the cotton plugged arm forward (the one next to the delivery tube) and replace the rear cotton plug with the sterile rubber stopper.* See that the U tube is filled to within $\frac{1}{2}$ " below the side arms. Tip the forward arm downward until the level of fluid is just below the outlet to the delivery tube.

4. Assemble the apparatus around the U tube (a) and stand as in Figure 7 (all vents open).

Thus:

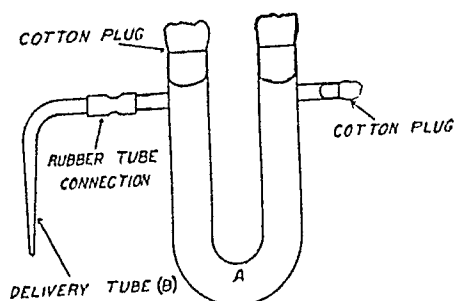
1. The sterile delivery tube (b) of the U tube is unwrapped, flamed and inserted beside the cotton plug of a second flask of sterile broth (c) for the final inoculation of the series. Caution: The tip must be kept dry. A drop of fluid in it will block the siphon, which operates when the clock rings.

2. To the side arm of the U tube opposite the delivery tube is connected the T tube (d) with vent and bulb (e), the cotton plug in the side arm being left in place.

3. The bulb (e) is placed between the compressor arms of clock No. 2, at the right of the stand.

4. The previously warmed flask of sterile broth (g) is now inoculated with the organism to be used, and shaken.

5. From the flask just inoculated, a sterile inoculating pipette (f) is filled by dipping the tip into the flask (g), drawing the fluid into the U, withdrawing the pipette and adjusting the amount retained by manipulating the bulb and opened vent.

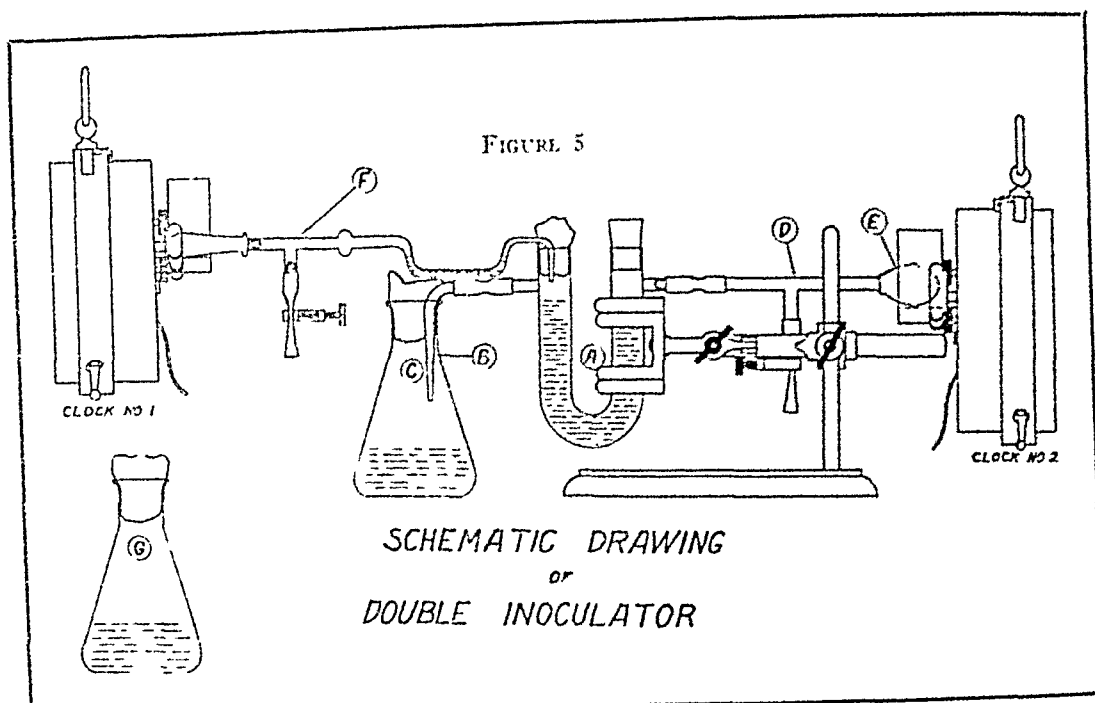


STANDARD "U" TUBE

FIGURE 4

* The rubber stopper must be tight. It forms the seal of the compressor device, which holds the positive pressure to start the siphon, and the negative pressure to stop it.

FIGURE 5



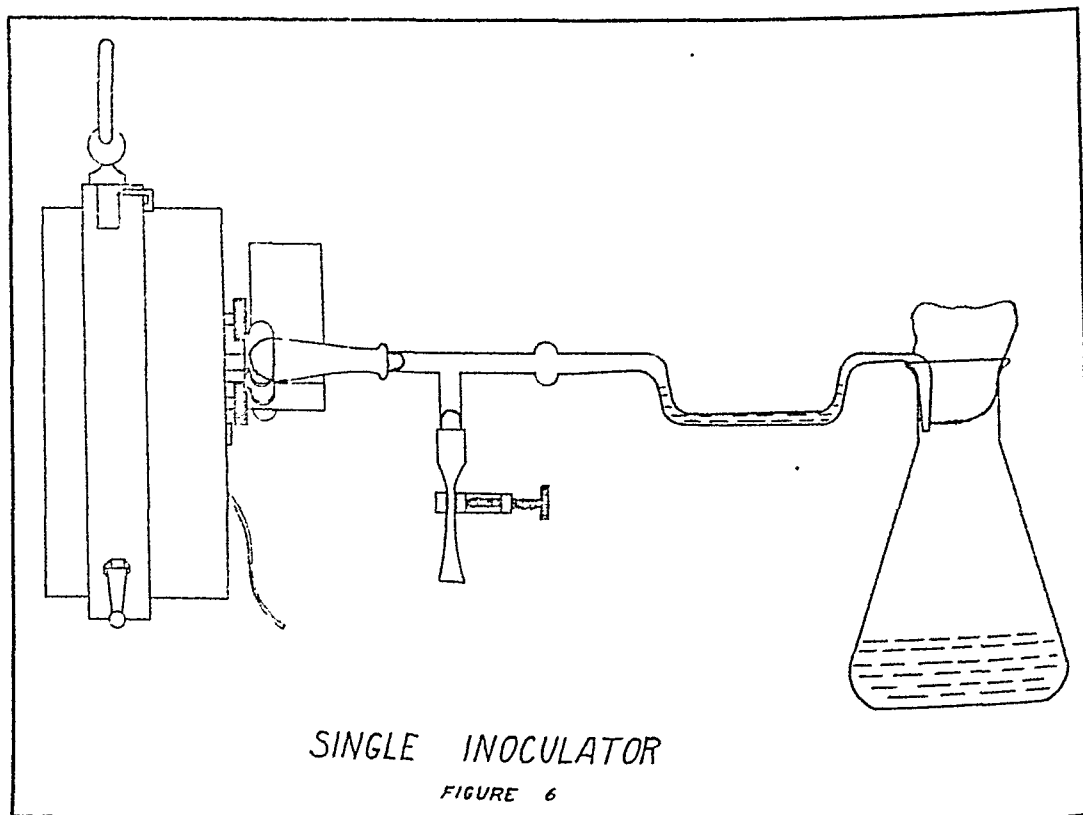
6. Flame the tip of the inoculating pipette thoroughly until dry and sterile and insert it beside the cotton plug of forward arm of the U tube (a) (vent open)

7. Place the bulb end of the inoculating pipette (f) between the compressor arms of clock No 1, which is placed to the left and to the rear of the stand, beside clock No. 2 for economy of space (vent open).

8. Place completely assembled outfit in the incubator (all vents open) and allow to warm for one-half hour.

9. Set alarm levers to ring, close vents tightly, tighten rubber stopper at (a) securely, and leave apparatus in the incubator over night.

10. Go to bed and sleep with confidence. The third generation culture will be ready for you in the morning.



The first phase of growth occurs in the inoculating pipette (f) as in the single inoculator. The second phase begins in the standard U tube (a) when clock No. 1 rings. The third takes place in the flask (c) beginning when

clock No. 2 rings, usually at 3 or 4 A.M., and gives rise to the desired third generation culture for morning use.

Arrangements have been made with the Central Scientific Company, Chicago, to furnish the essential parts and complete assembly ready for use.

KEEPING QUALITY OF KAHN ANTIGEN AFTER CHOLESTEROLIZATION

FANNIE MAE FRANK

Laboratories of Alabama State Board of Health, Montgomery, Ala.

KAHN¹ recommends that antigen, after the cholesterol has been added, be not used after 2 months. It has been our practice to adhere strictly to this procedure and discard any cholesterolized antigen more than 2 months old. Since the antigen is prepared in the Central Laboratory for use in 8 branch laboratories, this practice involves considerable waste, even though the needs of each laboratory are anticipated as carefully as possible.

In Table I are given the results of parallel tests with freshly cholesterolized antigen and several lots to which cholesterol had been added from 1 to 2 years before the tests. It seems ap-

TABLE I

Antigen	Age	No. of Tests	No. of Disagreement
3 F	2 years	106	1 (2 + with 3 F; negative with 10 C)
4 A	2 years	116	2 (negative with 4 A; neg. Kolmer test)
7 A	18 months	90	0
9 B	12 months	98	0
Total		410	3

parent that the cholesterolized antigen is entirely satisfactory for periods of at least 1 year.

REFERENCE

1. Kahn, R. L. *Serum Diagnosis of Syphilis by Precipitation*, 1925, p. 133.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Traffic Accidents in Tokyo, 1930
—With the remarkable increase in the number of motor cars in Tokyo, street accidents occurred so frequently that in 1930 deaths and injuries averaged 47 every day. According to the statistics of the Metropolitan Police in Tokyo, during last year there were 28,953 accidents, 17,062 of which resulted in the death or injury of the victims.

There were 17,124 motor car accidents, with 8,890 persons killed or injured; 6,205 bicycle accidents, with 4,504 persons injured or killed; tramway cars were the means of 2,929 accidents and 1,386 persons injured or killed. Accidents of motorcycles have been increasing year by year, the number of deaths during 1930 being more by 150 than the number for 1929. The total number of motorcycle accidents in 1930 was 1,298, with 892 injuries and deaths.

Pedestrians were the means of 558 accidents with 538 resulting injuries and deaths. According to the new regulation published last year, the injured pedestrians are to be punished in case they induce the accidents through their own carelessness.—*J. A. M. A.*, 96: 1968 (June 6), 1931.

Vital Statistics for Michigan, 1930
—Final figures for 1930 show Michigan to have achieved two record rates, the lowest death rate and the lowest infant mortality rate in the history of the state. Moreover, the maternal mortality rate was one of the three lowest in Michigan's history.

There were 51,561 deaths in Michigan during 1930, equivalent to a death rate of 10.6 per 1,000 population. This compares with the preceding 4 years:

1929 and 1928 with a rate of 11.9, 1927 with a rate of 11.3, and 1926 with a rate of 12.4.

In spite of the increase in the state's population, there were 4,556 less deaths than in 1929. There were 6,217 deaths of children under 1 year of age in Michigan in 1930, which is equivalent to an infant mortality rate of 62.9 per 1,000 live births. The rate in 1929 was 66.9. A generation ago, in 1900, this rate was 157.1. This makes the rate for 1930 only about 40 per cent of what it was 30 years ago.

There were 584 deaths in Michigan in 1930 from puerperal causes, which gives a maternal mortality rate of 5.9 per 1,000 living births, compared with 6.3 in 1929. This was bettered only by the rate of 5.7 in 1912, and 5.8 in 1916. The maternal mortality rate in 1900 was 10.3, a reduction of almost one-half in 30 years.

Michigan's birth rate for 1930 fell from 20.9 per 1,000 of population in 1929 to 20.4 in 1930. There were 98,882 births, 187 more than in 1929, but not a sufficient gain to hold the rate in the face of the increase in population. Comparison of the birth rates for the past 5 years shows a steady decrease in birth rates, from 22.5 in 1926; 22.3 in 1927; 21.2 in 1928; 20.9 in 1929; to the 1930 birth rate of 20.4. This falling birth rate is by no means peculiar to Michigan. Advance reports from various states indicate that a number of them will show a rate under 20 for 1930.—*Michigan Public Health*, 19: 75 (Apr.), 1931.

The Health of Ceylon, 1929—
With an estimated population of 4,750,000, the birth rate of Ceylon in

1929 was 36.8 per 1,000 population; the death rate 24.9; and the infant mortality rate 183 per 1,000 births. While Ceylon is particularly unaffected by outbreaks of insect-borne disease, it is greatly troubled by malaria. In Colombo alone, in 1929, 3,268 cases of malaria were admitted to the general hospital, 154 of these proving fatal. Cholera was responsible for 28 cases and 23 deaths, giving a fatality rate of 82.1. Eighty cases of plague occurred, of which 40 were in Colombo. Probably the greatest scourge of all, however, is hookworm disease. No less than 178,000 cases were treated in dispensaries, and 12,129 in hospitals; while the total number of deaths registered from hookworm disease was 2,172 for the island.

The total number of deaths in the last 5 years has not diminished, though it would appear that in certain districts the ankylostomiasis campaign is beginning to show results, as it is reported that the wards in hospitals in these districts are now almost empty. When it is considered that the bulk of the Asiatic population goes about barefooted, and that latrines, except in Colombo and some of the towns, are, if existent, but sparsely used, it is not surprising that it is difficult to reduce the incidence of this disease. Dental caries was found to be the most common ailment of the school children in Ceylon; and following this ailment, the next in importance was hookworm disease.—*Pub. Health*, 44: 243 (May), 1931.

Vital Statistics for Spain, 1930—According to provisional figures from the office of chief of statistics in Spain, there were 660,735 live births, and 394,355 deaths from all causes in 1930, resulting in a natural increase of 266,380 persons. Figures derived from 50 Spanish provinces, showed the birth rate for 1930 to be 29.03 per 1,000 population as against 28.92 in 1929,

with a stillbirth rate of 31.9 per 1,000 births, as compared with 31.4 in 1929. The rate for deaths from all causes was 17.33 per 1,000 population as against 18.03 in 1929. The infant mortality rate of 117 deaths of infants under 1 year of age per 1,000 live births shows an improvement over the 1929 figure of 123.

Among the diseases which showed a marked decline in mortality in 1930, the reduction in the death rate from all forms of tuberculosis was most striking—from 136.3 per 100,000 population in 1929 to 126.9 in 1930; pulmonary tuberculosis declined from 111.3 in 1929 to 103.3 in 1930. Pneumonia declined from 43.0 (1929) to 40.1 (1930); other diseases of the respiratory system, from 160.0 to 144.5; meningitis from 49.0 to 44.7; and organic diseases of the heart from 168.9 to 160.9. As contrasted with these reductions in death rates, the rate from cancer in Spain increased from 70.0 in 1929 to 72.3 in 1930; cerebral hemorrhage and softening of the brain showed an increase from 124.8 in 1929 to 125.7 in 1930; appendicitis and typhlitis, and cirrhosis of the liver showed slight increases, with rates in 1930 of 3.3 and 16.2 respectively.

Though there was a slight reduction in the death rate from typhoid fever, this disease caused 16.4 deaths per 100,000 population, in 1930. The death rate for diarrhea and enteritis under 2 years of age was 34.9 per 100,000 in 1930 as compared with 35.6 in 1929. Preliminary figures for deaths from suicide showed a death rate of 3.7 and violent deaths, excepting suicide, a rate of 29.—*Revista de Hygiene e Saude Publica*, 5: 195 (May), 1931.

Smallpox in the United States and Canada, 1930—Analysis of the reports received from 44 states, the District of Columbia and 6 Canadian provinces shows that there was a marked increase

in the incidence of smallpox in the United States, in 1930, but a decided decrease in the prevalence of this disease in Canada. There was recorded, in each country, a rise in the case fatality rate. Fortunately, however, the areas in which increases occurred were those in which there was a relatively low incidence of the disease.

Among the cities of the United States many had enormous smallpox sickness rates in 1930. In Waterloo, Ia., and Cleburne, Tex., there were 1,145 and 1,109 cases, respectively, per 100,000 population. Other very high rates prevailed in Davenport, Ia. (1,060); Ottumwa, Ia. (677); Sioux Falls, S. D. (594); Aberdeen, Wash. (566); Spokane, Wash. (543); Muncie, Ind. (490); Phoenix, Ariz. (453); New Philadelphia, O. (453). Rates between 300 and 400 were recorded for Quincy, Ill.; Des Moines, Ia., and Lima, O.

The rise in the prevalence of smallpox in the United States from 38,281 cases, in 1929, to 44,544 cases, in 1930, indicates a serious situation. But, disturbing as these figures are, their full significance is revealed only when it is realized that over 43,000 (97 per cent) of the 1930 cases occurred in states whose population aggregated but 54 per cent of the total population of the country. These states, in large part, are those in which anti-vaccination propaganda has been most active. In 2 states, Indiana and Ohio, there were reported over 5,000 cases each. California, Illinois and Iowa each reported over 3,000, and Kansas, Michigan, Oklahoma and Washington each had over 2,000 cases.

These figures may be compared with those reported by New England and the Middle Atlantic States, areas in which public support of the constituted health authorities for vaccination has been most responsive. Here, the country's most thickly populated region, a condition conducive to active propa-

gation of the disease, it is found that, among a population of approximately 37,000,000, there occurred only 479 cases and 2 deaths from smallpox, in 1930. To appreciate the full significance of these figures, one has but to realize that, if conditions in this area had been the same as those existing in Indiana, for example, there would have occurred 60,526 cases instead of a mere 479. Or, to put the matter in another light, if the 29 states with higher prevalence had been as active in their efforts to control the disease as were those of the North Atlantic Seaboard, there would have occurred only 860 cases instead of 43,361.

This condition is clearly indicative of the efficacy of vaccination as a preventive of smallpox. Where vaccination and revaccination are neglected, smallpox flourishes; in communities that are well protected, cases and deaths are rare, indeed.—Met. Life Ins. Co., *Stat. Bull.*, 12: 3-5 (May), 1931.

The Homicide Record of 1930 in the United States—During the last 31 years, the homicide death rate for 31 American cities with a collective population of nearly 25,000,000 in 1930 increased from 5.1 per 100,000 in 1900 to 10.9 in 1930. The rate during this period reached a first maximum of 11.3 in 1925, which is the highest figure on record or a little above the record for 1930. The homicide death rate for 147 cities which in 1930 had a population of over 39,000,000 increased from 10.4 per 100,000 in 1929 to 11.0 in 1930, the rate increasing in 73 cities, decreasing in 61, and remaining the same in 13.

The rates for individual cities in this group show wide variations. There were none in Lawrence, Lynn, Manchester, Pittsfield, Quincy, Salem, Somerville, Fitchburg, Gloucester, and Holyoke, Mass.; nor in Lincoln, Neb.; Newport and Pawtucket, R. I.; Union

City, N. J.; nor in Elmira and Mount Vernon, N. Y.

In 14 cities, which report comparable records for 1928, 1929 and 1930, the homicide rate exceeded 30 per 100,000. Of these, 12 are in the South, repeating in many cases the extremely high homicide death rates in that part of the country.

The highest rate for American cities is maintained, as usual, by the city of Memphis, Tenn., the rate having been 58.8 per 100,000 for 1930 as against a rate of 51.6 for the preceding year. With regard to Memphis, the fact must not be overlooked that the exceptional hospital facilities of that city attract patients from the surrounding country, which tends to exaggerate the local homicide death rate. But even when allowance is made for this fact, on the basis of a careful study of residents and nonresidents, the local rate still continues extremely high. During the year 1929, for example, out of 127 deaths from homicide in Memphis, 74 were residents and 53 nonresidents, making the death rate for residents in Memphis 30.9, or approximately three times the general rate for American cities. The next highest rate, 52.6, is for Atlanta, Ga., followed by Lexington, Ky., with a rate of 52.4.

In the 5 largest cities of the country, the number of homicides increased from 1,333 in 1929 to 1,425 in 1930. In

these cities, the highest rate for 1930 (14.4 per 100,000) occurred in Chicago, followed by Detroit with a rate of 13.3; Philadelphia with 7.7; New York with 7.1; and Los Angeles with 6.6. The United States homicide death rate is by far the highest for any civilized country in the world. The rate for Germany for 1927 was 2.0, showing a constant decline since 1920; that for Austria was 3.0; that for Hawaii for the period 1920-1930, 8.5; and that for England and Wales in 1929, only 0.5 as against a rate in the U. S. Registration Area of 8.5 per 100,000 for the same year.

The outstanding crime problem in America imperatively demands drastic restrictions in the sale and possession of concealable weapons. Approximately three-fourths of the murders in the United States are committed by firearms. In the State of Massachusetts, where the firearms law is reasonably well enforced, the murder death rate is relatively low, as shown by the fact that out of the sixteen cities showing no deaths from homicides in 1930, 10 were in Massachusetts. In New York City, out of 219 homicides, 52.1 per cent were caused by firearms; while in Memphis, Tenn., out of 127 homicides, 76.8 per cent were caused by firearms.—Frederic L. Hoffman, *The Homicide Record of 1930. Spectator*, 126: 9 (Apr. 9), 1931.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

A MECHANICAL AID FOR ISOLATING *B. COLI*

E. L. FILBY, C. E., F. A. P. H. A.

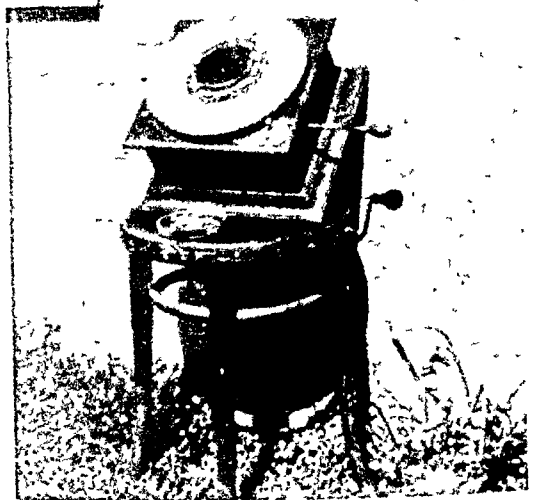
Chief Engineer, State Board of Health, Jacksonville, Fla.

IN plating out lactose splitting organisms on eosin methylene blue plates to determine characteristic *B. coli* colonies, the water laboratory of the Bureau of Engineering, Florida State Board of Health, was seldom able to pick up isolated characteristic colonies due to overgrowths. It was suspected that organisms in the water which split lactose after 18 hours' incubation at $37\frac{1}{2}^{\circ}$ C. included *B. coli*, but the problem was how to prevent the overgrowths so that this suspicion could be definitely confirmed.

An old Victor hand wound disk phonograph was obtained and the felt protecting the turntable and centering pin removed. Then a $4\frac{3}{4}$ " diameter "New Daisy" rubber sink stopper was cemented to the turntable at the center. This rubber stopper was shaved down to make a flat resting surface for a petri dish. Next a $2\frac{1}{2}$ " ruby eraser was cut into cubes about $\frac{1}{8}$ " to $\frac{1}{4}$ " high. The petri dish resting on the sink stopper was centered on the turntable and the small cubes cemented to the stopper around the periphery of the dish, allowing about 9 of these guides for 9" of the dish's perimeter and an open space of about 2" for placing and removing the plate. The turntable speed was adjusted to about one revolution per second when the machine was fully wound up.

The procedure of use of this revamped talking machine is as follows: Wind up the phonograph, insert the eosin methylene blue plate, numbering it to coin-

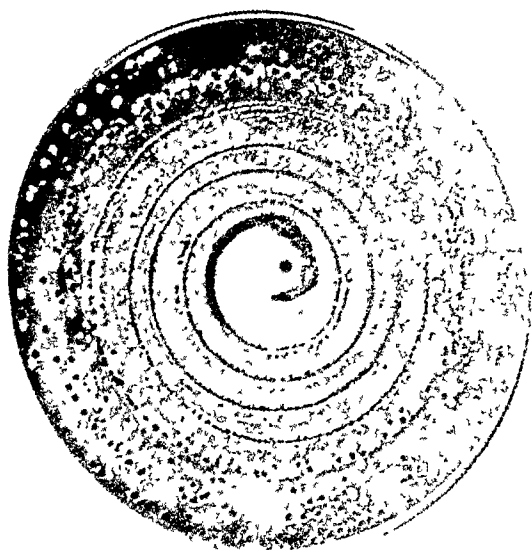
cide with the sample and dilution number, have at hand the fermentation tube and the platinum needle, flame both the



tube and the needle, remove the cotton plug, insert the needle into the fermented broth, reinsert the plug and return the tube to the rack. Then open the brake on the phonograph turntable so that it starts, remove the petri dish cover and hold the broth coated needle at the center of the petri dish for about two revolutions, then slowly push the needle in a straight line toward the edge of the petri dish. In this operation the needle rests lightly on the media without turning. When the needle hits the edge of the plate, lift it, permitting the wrist to stop the turntable, then replace the cover of the plate and remove it.

The needle must have a slight bend

upward at its end so that it will slide over the media as a spoon would. About ten revolutions of the turntable



are made while the plate is being streaked and the time necessary to complete the streak done as above indi-

cated is about 23 seconds. Isolated colonies are easily picked off around the edge of the plate as shown in the photograph. The only disadvantage to this scheme is that a separate plate must be used for each lactose broth portion showing gas.

Dr. Paul Eaton, Director of the Diagnostic Laboratories of the Florida State Board of Health, suggested this idea but it was developed by Lena W. Starck, analyst of the Bureau of Engineering, to such a point that it is now routine procedure. The number of plates positive for *B. coli* as determined by reinoculation of characteristic colonies in the lactose broth has increased considerably over the former results.

The idea of turning the plate mechanically was suggested in the *Journal of Bacteriology* some years ago, but the phonograph is more easily obtainable than the means suggested in that article.

THE BECCARI SYSTEM OF GARBAGE DISPOSAL IN FLORIDA

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THE Beccari system of garbage disposal originated in Italy some years ago and had its first application in this country at Scarsdale, N. Y. Briefly, the system takes advantage of the natural decomposition of organic wastes, this action taking place in closed cells. The cells are usually concrete but may be of brick or vitrified tile. In about 35 to 40 days the garbage which has been placed in a cell has been reduced to an inodorous humus with a loss of weight of about 85 per cent.

The second plant built in this country was at Dunedin, Fla., which was followed closely by a plant at Belleair, Fla. Both of these plants were constructed

after successful experiments with a very small single cell built at Belleair and filled with garbage which included fish-house wastes and an unusually large amount of citrus wastes. Additional plants have also been built at South Jacksonville and Plant City while an experimental cell was built by the National Juice Company at Tampa for the reduction of citrus wastes.

The plant at Dunedin is a 5-cell concrete structure, each cell of standard size 9' x 8' x 6' 6", and holding about 18,000 lb. of raw garbage. Garbage is placed in layers on wood racks 24" center to center. The tops of the cells slope and the entire lid must be lifted to place garbage in the cells. These

lids are necessarily very heavy and are counter-weighted to facilitate lifting. In addition a corrugated iron building houses a grinder and storage for the ground humus. The entire cost of the plant was \$4,500. The former method of disposing of garbage and trash was to burn it and rake the residue over into a pond. The dump cost the city \$24.80 per month for labor and \$30.00 per month for oil and disinfectants. Since the installation of the Beccari plant at the dump, trash is still burned there. However, the monthly cost of operating both the Beccari plant and the dump is \$5.20 per month which takes in all items, including fuel for the gas engine which operates the grinder. The city manager has estimated the cost per ton of humus produced at \$2.62, while the return has been \$22.50 per ton and the demand for it greatly exceeds the supply.

No nuisance has resulted at any time from the operation of this plant. On the contrary fly and rat breeding have been eliminated as well as scavenging by buzzards and the production of odors by burning garbage.

The Belleair plant was adapted to the peculiarities of the community which has a year round population of 250 and a winter population of 2,500. Eight cells were built equivalent to three standard cells. The construction was of vitrified tile and light hatches for charging the cells were built in place of the heavy over-all lids of the Dunedin plant. Likewise the racks in the cell were made of 1" x 3" cypress in place of 2" x 4" strips used at Dunedin. Trash is burned as formerly but with no nuisance as formerly. The amount of humus from this plant is small, about 7½ tons annually, and is used locally for park purposes. A ready sale is found for any surplus.

The South Jacksonville plant is a standard-cell concrete structure, 21 cells in all, serving a population of

5,600. To take care of trash a small incinerator was built at a cost of \$400. Operation costs are about the same as formerly when a dump was operated but the use of oil and disinfectants has been eliminated. A small brick building houses the grinder and motor and provides storage for sacked humus. Trucks are driven on a ramp between the two rows of cells and dumped sideways through steel hatches into each cell. The cells are discharged beneath the ramp. Although there are many houses immediately surrounding the plant, there are no complaints of odors.

The Plant City plant is a 10-cell structure of concrete. This plant uses outside ramps on each row of cells for charging through hatches. The cells are discharged inside the building covering the plant, which also houses grinder and motor, provides storage for humus, and also storage for sanitary department equipment. The cost of this plant was \$7,081.74, complete.

The cell built by the National Juice Company at Tampa was to experiment with citrus wastes including rag and peel. Lime was added to counteract the acid in the waste and the results were excellent.

Generally speaking the Beccari plants in Florida have proved themselves to be ideal methods for disposition of the garbage. The cost is comparable with that of incinerators and the product is salable with the demand exceeding the supply. There are no nuisances from flies or vermin, and the odorless process of decomposition has enabled the cities to place their plants much closer to thickly settled areas with no complaints. The result has been a material saving per ton-mile of garbage hauled and in the cases where this saving has been accomplished, the residents have secured better garbage collections through more frequent service.

The life of tires has been increased materially through the elimination of

roads littered with cans, broken bottles and abrasive materials. The separation of trash and garbage has caused an additional small revenue to the city treasuries through the recovery of junk, bottles, rags and paper which were formerly dumped and burned or buried.

The sale of humus has made it possible for the cities to get some interest on their investments and there is a ready demand for the product which has excellent fertilizer properties. The humus as it comes out of the cells is dry although it retains its original shape and weighs but 15 per cent of the original charge of raw garbage. It is easily ground and when sacked may be stored away without nuisance. A slight odor of ammonia is noticeable when the cells are first opened.

Separation of garbage and trash is essential. This is usually accomplished by an ordinance requiring separation and its enforcement by refusal to pick up unseparated trash and garbage. Vio-

lators are liable to prosecution.

The trash left is readily burned or buried in the open without nuisance and in the case of South Jacksonville, a small, cheaply constructed incinerator takes care of it. No fuel is needed in the operation of the incinerator. The City of South Jacksonville also gives 50 lb. samples of humus to its residents to aid their campaign for separation of trash and garbage.

The first cell was placed in operation in Dunedin in October, 1928, and since that time no nuisance has arisen at any of these plants and no complaint has been made. In closing, it should be noted that in charging a cell it should be closed within 4 days after the charging starts. Otherwise decomposition odors in the cell will create a definite odor nuisance. The cities that have installed these plants are pleased with the results from their plants and the Beccari system has proved worthwhile in each case.

AN UNUSUAL INSTALLATION OF CHLORINE EQUIPMENT

E. L. FILBY, C. E., F. A. P. H. A.

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AN interesting and unusual installation of chlorinating equipment has recently been made in Florida by the citrus industry. One of the nationally known dairy companies this season established a plan in southwestern Florida to extract and freeze orange juice. This juice, put up in attractive cardboard containers, is shipped to northern markets under low temperature conditions, where it is distributed to the consumer by milk men on their morning rounds.

Every precaution is taken to insure sterility of the outside of the orange before the juice is extracted. On a conveyor the oranges are passed through

a bath, washed and scrubbed before reaching the juice extractor. In the short period between scrubbing and juice extraction, bacteria, yeast and moulds were found to multiply rapidly on the skin of the orange. To inhibit this growth a final shower of water containing 15 p.p.m. of free chlorine was arranged over the conveyor immediately prior to the juice extraction equipment. The shower is controlled by a float in a constant level box and the chlorine at the rate of 15 p.p.m. is fed by a solution feed chlorinator into the water entering the box. The plant chemist checks the chlorine application at regu-

lar intervals by the orthotolidin test.

This treatment is in keeping with the rest of the plant, where cleanliness is the watchword, and no effort has been spared to insure purity of the prod-

Biological Investigation of the Water Purification Plants of Calcutta Corporation—Numerous complaints led to a proposal for the scientific investigation of the filtered water of the City of Calcutta. Observation and examination of the material collected proved that the source of all trouble was the abundant growth of plant organisms in the storage tanks and filter beds. The general method of the filter works was then briefly described. This showed a tank known as the "New Storage Tank" in the main source of supply of water for the public of Calcutta.

Illustrations and descriptions showed the conditions of the settling tanks, which explains why the filtered water could not be expected to be very clear and healthy. One day, bubbles of gas were observed to burst on the surface of a filter bed, and later this gas was ascertained to be marsh gas. During the rains, the average condition of the water is generally improved, due to the rain water increasing the oxygen content

uct. The results obtained by the chlorination of the outside of the orange have been most favorable and have contributed to an attractive and satisfactory final product.

of the water, and by mechanical agitation of the surface water.

The biology of the plant and animal organisms in the New Storage Tank and filter beds is then discussed in detail. This brings out the fact that the abundance of nitrates and other compounds dissolved in the water led to the rapid development of phytoplankton in the filter beds. The filter beds were also damaged by having holes made in them by members of the animal kingdom as they grew, feeding on the plant kingdom. This showed the two-fold need for the eradication of algal vegetation.

In conclusion, it is stated that in spite of any scientific remedial measure which may be suggested hereafter, for the present as also for the future, the most important factor will be to keep the whole place thoroughly clean and clear.

At the end of the article is given a list of the various Phanerogamic specimens collected during the study.—K. Biswas, Curator, Herbarium, Royal Botanic Garden, Calcutta, India. Abstr. by R. E. Reinke.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M.D., PH.D., AND LEONARD GREENBURG,
M.D., PH.D.

Handbook of Labor Statistics, 1929 Edition—This is the second handbook of labor statistics to be published by the Bureau of Labor Statistics. The first handbook (*Bull. 439*), issued in 1927, sought to bring together in convenient form for reference purposes digests of the material published by the bureau prior to the year 1927. The present handbook supplements the former one by presenting similar digests of the material published by the bureau in the years 1927 and 1928. Thus, the two handbooks, used together, constitute a convenient abbreviation of practically all the published work of the Bureau of Labor Statistics of sufficiently recent date to be of present-day interest. The material presented in these handbooks represents in large part the original work of the bureau, but this is by no means entirely the case.

Pages 249–285 are concerned with industrial accidents, from the statistical as well as the exposure point of view, including a number of principal industries. The chief interest to us here, however, is the valuable section on industrial health, pages 287–405. Here, federal agencies concerned with problems of industrial health and a review of recent studies of industrial diseases and poisons, morbidity and mortality statistics, legislation, health and working conditions comprise the topic headings. There is a further section on industrial home work, pages 407–437.

Dangerous trades and industries, industrial poisons and other hazards, and most of the chief occupational diseases of current interest are represented by special articles, usually synopses of the originals, accompanied by the proper

references.—*Bull. 491*, Miscellaneous Series, U. S. Bureau of Labor Statistics, Washington, 914 pp. with Index (Aug.), 1929, price \$1.00.

Dangers in Refining Radioactive Substances—It is hoped that this and similar investigations may lead to the removal of all dangers involved in the handling of unsealed radioactive substances. In a series of decomposition products of radium and mesothorium the principal sources of danger ordinarily present are the gamma radiations (particularly radium C, mesothorium 2, and thorium C") and the radioactive gases in the atmosphere (radon and thoron).

Ten micrograms of radium deposited in the body is probably the tolerance limit of the average person. The electroscopic examinations give a timely warning of danger, far more sensitive than any other method. Since the blood of the workers employed in the refining processes described showed no abnormality (the abstractor is hardly inclined to believe this after an inspection of the tables of blood counts of 3 workers employed in the mesothorium laboratory), it is concluded that the exposures have produced no injury to the blood-forming organs. None of the workers (5 in all) has experienced any debilitating effects.

Inasmuch as the precautions now taken are far in advance of those formerly taken, going back for over a period of 10 years after ceasing work, it is concluded that exposure to dangerous radiations may be reduced to a negligible extent, at least where the exposure period is not over 2 or 3 years.—

Herman Schlundt, William McGavock, Jr., and Mildred Brown, *J. Indust. Hyg.*, XIII, 4: 117-133 (Apr.), 1931.

The Toxicity of Certain Benzene Derivatives and Related Compounds

—The outstanding pathologic picture seen in animals poisoned with the various benzene derivatives was a tendency to extravasation of blood in the lungs. A considerable number of benzene derivatives were investigated. With most of the preparations the toxicity was rather low. There is very little danger of accidental poisoning in industry with any material having a minimum lethal dose of over 0.25 gm. per kilo, or 17.5 gm. for a man weighing 70 kilos. Even with limits under that point but over 0.1 gm. per kilo, there is little danger in handling the preparations if thought and reasonable precautions are given to the matter. Personal idiosyncrasy must be kept in mind however. Also that fat soluble or lipid soluble materials, if water insoluble, may poison by skin absorption in doses not toxic by mouth.

It must be emphasized that the toxicities here reported refer only to administration of solids or liquids by mouth. Some of the substances may be decidedly more toxic, however, by skin absorption, and also through inhalation. Therefore these results do not necessarily represent the hazards of industrial exposure to vapors or to skin absorption.—Henry Field Smyth, *J. Indust. Hyg.*, XIII, 3: 87-96 (Mar.), 1931.

The Reduction of Mine Air Temperatures—Authors' summary—

Various methods of obtaining a cooler atmosphere in mines have been mentioned, and an experiment in local air conditioning by means of artificial humidification has been described.

The air conditioning was tried on a coal face 170 yards in length, and the effects of humidification were ob-

served when the apparatus was placed (a) 120 yards away from the face, and (b) close to the face. In the former case the conditioning reduced the air temperature by 7°, but the temperature rose quickly, and by the time the coal face was reached it was only 2.1° lower than under normal conditions. With the apparatus working close to the coal face the air reached the face 7.8° cooler than under normal conditions, but after traversing 35 yards of face the cooling effect was reduced to 1.9°, and further along the face the effect was barely noticeable.

The conditioning caused no sensible rise in the wet bulb temperature.

It is concluded that air conditioning by this method is not likely to be of value for general application, but that it might be used as a palliative measure in certain circumstances.—T. Bedford and C. G. Warner, *J. Indust. Hyg.*, XIII, 4: 135-139 (Apr.), 1931.

“Industrial Health Digest”—This monthly 4-page pamphlet, formerly “The Stethoscope,” began with Vol. I, No. 1, the May issue, 1931, and is to be devoted to especially selected articles and notes of interest to industrial physicians and surgeons. The editor, Dr. C. O. Sappington, Director, Division of Industrial Health, National Safety Council, Chicago, has built up a representative advisory committee and is also giving publicity to the work of the various health committees of sections composing the National Safety Council. The articles or abstracts are all brief and carefully edited.

Pneumoconiosis: The Delayed Development of Symptoms—The authors report 4 cases: (1) Development of symptoms of silicosis 23 years after an exposure of 4 months; (2) Development of symptoms of silicosis 10 years after an exposure of 2 years; (3) Development of symptoms of silicosis 14 years after an exposure of 4 years;

and (4) Development of symptoms of silicosis 10 years after an exposure of 10 years. A number of years of entire freedom from symptoms following the earlier exposure was the case in each instance. Tuberculosis eventually developed in each instance.

The authors point out that most clinical and statistical studies of silicosis have been made on groups of men still employed in dusty trades. From such statistics one cannot say what is the late effect of short exposures.

These instances suggest the necessity of revising the conception of the length of exposure necessary to produce the disease and make it seem probable that after relatively short exposures sufficient dust may be deposited in the lungs to set up a progressive fibrosis, which only after many years becomes sufficiently extensive to produce symptoms. They tend to indicate that men in the work develop symptoms only after many years of exposure, not because that length of exposure is necessary but because it takes a long time for the disease to develop.

—James A. Britton and Jerome R. Head (Chicago), *J. A. M. A.*, 96, 23: 1938–39 (June 6), 1931.

Medico Legal Aspects of Disability in Industrial Lead Poisoning—The present paper concerns prognosis and disability in lead poisoning, and is based upon experiences with over 200 cases observed during the last few years. The details of 12 cases and a résumé of about 90 others constitute the basis upon which the conclusions are reached.

An illustration is given, also, of the dangers of over-confidence in safeguards: a thoroughly modern plant with presumably every known safeguard including physical examinations at frequent intervals and even ordinary illnesses treated by the plant physician, nevertheless resulting within a comparatively short time in a veritable epidemic of lead poisoning in which a great many men were taken acutely ill. "The ex-

planation lies in the very nature of the industry and its inherent hazards."

Industrial lead poisoning is a very costly affair. The annual wage loss attributable to this disease amounts to millions of dollars and the annual total loss to about 5 or 6 times that amount. At present, lead poisoning is compensated, it is thought, in 12 states only, but "the worker still pays the bill in pain and suffering, impaired productive power, workless and wageless weeks and years, and consequent lowered standard of living. It has been estimated that the injured workman assumes from three-fourths to four-fifths of the financial loss attending his incapacity even under the most liberal compensation laws."

Despite the fact that a goodly portion of the lead industry endeavors to avoid payment of compensation for lead poisoning, instead of preventing it and curing when it does occur—as by signing up each employee as an independent contractor, or discharging one dissatisfied race and employing another, or certifying that men ill with lead poisoning were suffering from grippe, influenza, and gastritis—the industry as a whole is willing to coöperate and eradicate lead poisoning from its midst provided it is given the proper incentive and guidance.

That a true case of lead intoxication usually leaves an indelible imprint upon the human system and causes permanent pathologic changes no one disputes. Nor is it denied that poisoning by the same metal may terminate fatally. While Dr. Joseph C. Aub had stated that encephalopathy and peripheral nerve changes may be permanent in nature, but he had no evidence to prove or disprove other organic changes, Dr. E. R. Hayhurst, Dr. Harrison S. Martland, Professor Chayes and Dr. Levin of the Berlin-Lankowitz Hospital (the last two mentioned had made a study of 1,500 cases of lead poisoning), were convinced of other organic changes, as in the kidneys, etc.

After a brief discussion of the organic effects and duration of temporary disability, the author discusses like features of permanent disability. He concludes that about 50 per cent of his cases have cleared up and left no appreciable disability, or have not reached the stage where permanency could be established.

The subjective and objective symptoms of the cases studied, in the order of their frequency, were as follows:

SUBJECTIVE

	Per cent
Persistent headache	70
Dizziness	60
Obstinate constipation	52
Muscle group weakness	48
Premature fatigue	36
Epigastric pains	35
Visual disturbances	33
Arthralgia	32
Shakes	32
Insomnia	20
Periodic vomiting	18
Loss of weight	14

OBJECTIVE

	Per cent
Anemia	60
Eye-ground changes	33
Tremors	32
Unsteady station	25
Hypesthesia and hypalgesia	20
Nephritis	18
Arteriosclerosis (premature)	16
Lead line	16
Cardiac lesions	12
Retinal hemorrhage	11
Facial palsies	10
Dyspnea	9
Wrist and ankle drop	5
Convulsions	2

ability clause to the policy. While this is not conclusive, it is rather significant, in view of the attitude of the insurance companies, who base their opinions on past experience.

Among chief observations were the following: (1) Wrist drop was comparatively rare, with the exception of the painter who used his wrist muscles more than the others; (2) The blood picture is of diagnostic significance in the acute and subacute stages, but is of no import in the chronic stage, which may display a practically normal blood; (3) Persistent headache, dizziness, constipation, general weakness, visual disturbance, muscle and joint pains, in their respective order, are the chief complaints of the patient suffering with chronic plumbism; the other symptoms are just as definite, but less frequent; (4) Clinical pictures and blood findings may vary by industries: white lead workers showed a persistently low hemoglobin, smelterers, a low red blood count; and lead battery workers, arthralgia and myalgia; (5) Workers with chronic plumbism are ready victims for intercurrent diseases, particularly tuberculosis. Incised or lacerated wounds "fester" and the duration of the ordinary cold is out of proportion to its severity; (6) Over-worked men have a longer period of temporary disability and are subject to most residual damage; and (7) The length of exposure was of no material significance. Some men with 2 or 3 weeks' exposure suffered from a more intense attack and were left with greater disability than those with long years of exposure.

CONCLUSIONS

In reply to a questionnaire sent to the medical officers of 30 life insurance companies scattered throughout the United States and Canada we received the advice that a man who had suffered from industrial lead poisoning would not be issued ordinary life insurance and would be "rated" up for a substandard form of insurance. Practically none would issue health insurance or attach a dis-

1. A mild case of lead poisoning may leave no permanent disability.

2. The gastrointestinal type of lead poisoning is of a temporary nature and the resulting persistent constipation is not disabling in character.

3. The cerebrospinal form of lead poisoning is the most distressing in its manifestations, most destructive in nature, most per-

manent in character and may result in total permanent disability.

4. The kidneys usually show the most degenerative changes.

5. Long hours and overwork are conducive to greater disability.

6. Chronic lead poisoning sufferers have a lowered resistance, are poor risks for health insurance, and have a shorter life expectancy.

While the author is not able to produce the legal proof, he feels that once a man suffers from a severe industrial lead intoxication he never completely recovers from it and carries the sequels to the end of his days.—Max Kummel, *J. Med. Soc. of New Jersey* (Apr.), 1931, 7 pp.

Studies on Experimental Pneumonokoniosis. VI. Inhalation of Asbestos Dust: Its Effect upon Primary Tuberculous Infection (Concluded)—The experiments demonstrate that fibrous structures at least as long as 200μ can pass the protective mechanism of the upper respiratory tract and enter the lung. Inhaled asbestos dust does not penetrate to the terminal alveoli of the lung as is the case with a particulate substance such as quartz.

The rate of infiltration of lymphoid tissues in the lungs varies considerably with the animal exposed. Asbestos bodies appeared in the lungs of guinea pigs in approximately 70 days but were not discovered in rabbits after 330 days. These bodies are produced by oxidation and hydrolysis of the chrysotile molecule (of asbestos). They are evidence that the body is capable through chemi-

cal processes of effecting changes in inhaled silicate particles.

Granite dust remains within the pulmonary air spaces and produces no local reaction of fibroblasts for several years, but in the lymph nodes characteristic silicotic nodules develop within 2 years. Carborundum failed to affect the lung tissue even in 4 years, but fibrosis in the lymph nodes was observed in 4 years. Quartz is rapidly concentrated in the lymphoid tissues with a rapid formation of fibrous tissue. Asbestos is concentrated in the bronchioles and their lateral alveoli. Phagocytes carry it into the walls, where fibroblasts are stimulated.

Primary tuberculous infection is influenced only to a limited degree by inhaled asbestos and the tendency to healing by fibrosis was marked; at autopsy 40 per cent of the cases showed healed fibrous tuberculosis. The contrast with quartz dust was marked. Here, in every exposure longer than 5 months, generalized tuberculosis of the lungs and other viscera resulted. In one group of guinea pigs infected with tuberculosis 2 years after the commencement of dust exposure, the localization of tubercles was atypical, while early disease in the spleen and hepatic lymph nodes was the rule. The combined action of asbestos dust and tubercle bacilli in the lung produced more fibrosis than did either agent acting independently.—Leroy U. Gardner and Donald E. Cummings, *J. Indust. Hyg.*, XIII, 3: 97-114 (Mar.), 1931.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Nutritive Value of Potato Protein and of Gelatin—The literature records some instances of continued growth and maintenance on an exclusive diet of potato or potato with both nitrogenous and non-nitrogenous supplements. Relatively satisfactory results were obtained in human beings but the converse in the case of rats. On the theory that the poor results reported were due to a low protein level, experiments were undertaken with potato preparations containing small amounts of starch.

Tuberin contains sufficient amino acids which are lacking in gelatin and which are essential for satisfactory animal growth. The percentage of tryptophane in tuberin is unknown.

A basal diet, used on young albino rats, consisting of a potato preparation, salt mixture, dextrin and cod liver oil, provided 9 per cent of crude potato protein. The potato ingredient was prepared so as to eliminate most of the starch and the product contained 3.48 per cent of nitrogen. On the basal diet the rats maintained their weight for a period of 3 weeks. The addition of 10 per cent commercial casein after extraction with hot alcohol produced immediate growth response which ceased when the casein was withdrawn.

No change resulted after the addition of 4 per cent yeast, untreated, or autoclaved to destroy vitamin A. Ten per cent of gelatin did not make up the protein deficiency apparent in the basal diet. The addition to the gelatin of tyrosine, tryptophane or cystine in combination produced no better results, and growth was not adequate when the

gelatin was increased to 20 per cent. Casein and lactalbumin were fed as 4, 7, and 10 per cent additions to the basal diet.

The experiments indicated no important difference between the proteins on the 7 and 10 per cent levels, but at the 4 per cent level lactalbumin as an addition was superior to casein. The authors conclude that casein and lactalbumin contain an essential dietary factor lacking in the potato preparation and in gelatin and that this factor is not one of the known amino acids.—D. Breese Jones and E. M. Nelson, *J. Biol. Chem.*, 91: 705 (May), 1931.

The Organic Acids of Spinach, Broccoli and Lettuce—The value of acids in food metabolism depends upon whether the acid is easily metabolized, as citric and malic, or difficultly metabolized, as oxalic or benzoic. Certain green vegetables have been examined for oxalic acid and the work here reported was undertaken to include other organic acids.

The spinach, broccoli and lettuce used in this experiment were purchased on the Washington market, and oxalic acid was determined by the method of Arbenz (*Mitt. Lebensm. Hyg.*, 8, 98, 1917). Since no complete analysis of broccoli has been published a complete examination was made and is reported in a table. Spinach was found to contain 0.31 per cent oxalic acid. Citric acid and a small quantity of malic acid were separated by the ester distillation method. The predominating organic acid in broccoli is citric acid. It also contains 1-malic acid and small amounts

of oxalic acid and succinic acids. The analysis shows that the leaves and buds have practically the same composition and nutritive value. Both the buds and leaves contain proteins somewhat in excess of that previously reported in spinach. Lettuce was found to contain oxalic acid, 0.011 per cent, l-malic acid, about 0.065 per cent, and citric acid, about 0.048 per cent.—E. K. Nelson and H. H. Mottern, *J. Am. Chem. Soc.*, 53: 1909 (May), 1931.

Vitamins in Canned Foods. X—The Vitamin Content of Some Common Vegetables—Since the commercial canning of turnip greens has developed considerably during recent years a study was made to compare the vitamin A and C content of this article of food with other green vegetables. The vegetables used were head lettuce (inner and outer leaves), celery (bleached and green), and raw carrots (whole and shredded for 1 to 3 hours before feeding).

Twenty-five mg. of canned turnip greens supplied more vitamin A than 5 gm. of bleached celery and as much as 500 mg. of unbleached celery. They were found to be unsurpassed by any other vegetable and comparable to spinach. Canned turnip greens, head lettuce, and celery are not rich sources of vitamin B. There was found to be more of the B₂ (G) fraction than of the B₁ fraction in canned turnip greens. Head lettuce was superior to celery and canned turnip greens in its content of vitamin B complex.

Compared with canned turnip greens, the vitamin C content of head lettuce, celery and raw carrots was surprisingly low in view of the general belief that raw vegetables are always a good source of vitamin C. Two to 4 gm. of turnip greens gave better growth and less evidence of scurvy than 5 gm. of celery, green or bleached, 10 to 15 gm. of head lettuce, inner or outer leaves, or 10 gm.

of whole or 15 gm. of shredded carrots. —E. F. Kohman, W. H. Eddy, and Celia Zall Gurin, *Indust. & Eng. Chem.*, 23: 808 (July), 1931.

Increasing the Vitamin D Potency of Cow's Milk by the Daily Feeding of Irradiated Yeast or Irradiated Ergosterol—In this experiment, irradiated yeast and irradiated ergosterol were fed and compared as sources of vitamin D for dairy cattle. Twenty-one Holstein-Friesian cows, each producing more than 45 lb. of milk daily on a three-time milking schedule, were selected at random for experimentation. They were separated into 7 groups, each containing 3 cows. Throughout the experiment, which included a preliminary feeding period of 3 months and a supplemental feeding period of 4 weeks, all cows received the same basal ration of alfalfa meal, corn silage, beet pulp and grain mixture.

Group I, or the control group, received nothing but the basal ration and water. During the supplemental feeding period the basal ration of the other groups was fortified with vitamin D obtained from irradiated yeast and irradiated ergosterol.

The cows were exercised at midnight to avoid the sun's rays. Throughout the experimental feeding period, each cow in groups II, III, and IV received 10,000, 30,000 and 60,000 rat units per day respectively of vitamin D as irradiated yeast, while those in groups VIII, IX, and X received 15,000, 45,000 and 135,000 rat units per day respectively of vitamin D as irradiated ergosterol dissolved in relatively small quantities of corn oil.

The vitamin D potencies of the butterfats from the cows in the first three groups were approximately 2, 8, and 16 times respectively that of the butterfat obtained from the control group, while the vitamin D values of the butterfat from the cows in the last 3 groups were

approximately 2, 4, and 16 times respectively that of the negative control. The fact that vitamin D potency of cow's milk can be increased at least 16 times by feeding is important, since milk with its high calcium and phos-

phorus content can be made a still better food. These investigations are being continued and will be published by the authors later.—Byron H. Thomas and Florence L. MacLeod, *Science*, 73: 618 (June 5), 1931.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

The Proposed Committee on Teaching Obstetric Nursing of the White House Conference on Child Health and Protection—In last month's notes it was revealed that a survey by the White House Conference on Child Health and Protection Subcommittee on Obstetric Teaching and Education of Nurses and Nursing Attendants showed that obstetric teaching in schools of nursing has been inadequate. Improvement depends upon improving the conditions affecting teaching of obstetric nursing unfavorably in the nursing schools or devising a way to give obstetric training to large numbers of nurses before they are permitted to care for maternity cases. The formation of a committee was suggested to work on this problem and consider the following:

(a) Studying the preparation in obstetric nursing in those countries where it is considered a postgraduate subject and comparing it with a study of our present methods.

(b) Preparing a fundamental curriculum for theoretical instruction and practical experience in obstetric nursing that will be sufficient to teach nurses what adequate ma-

ternity care is and how to give the nursing part of it from the beginning of pregnancy through the puerperium.

(c) Preparing a plan for securing the approval and gradual adoption of the curriculum by schools of nursing throughout the country.

(d) Preparing a curriculum for postgraduate courses in obstetric nursing which will be supplementary to the fundamental courses and will be planned primarily to prepare experts in obstetric nursing and not to supply additional nursing service for the hospital.

(e) Preparing a plan for securing such courses in certain selected hospitals.

(f) Forming a subcommittee to study the best way to prepare, control, employ, and supervise attendants, nurses' aids, home helps, practical nurses, and others of this type who care for maternity patients.

—The White House Conference on Child Health and Protection. Excerpts from the Report of the Subcommittee on Obstetric Teaching and Education of Nurses and Nursing Attendants, *Am. J. Nurs.*, XXXI, 5: 585 (May), 1931.

The Chicago Conference—Seventeen state supervising nurses, 16 directors of postgraduate courses in public health nursing, 5 presidents (or their representatives) of S. O. P. H. N.'s, and 6 chairmen of public health nursing sections of state nurses' associations—in all representing 26 states—gathered in Chicago in May at a 2-day meeting

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

called and arranged by the National Organization for Public Health Nursing, because of the expressed desire of these groups for an opportunity to discuss their programs and problems with other nurses in like positions and with the National Organization for Public Health Nursing.

There were two general meetings, and the rest of the time the nurses divided into groups for closed meetings. At the first session Dr. Bishop of Tennessee and Dr. Walker, recently of the American Public Health Association, now of the Commonwealth Fund, gave papers; Dr. King of Indiana, and Dr. Harper of Wisconsin, representing the State and Provincial Health Authorities of North America, joined in the discussion.

The purpose and spirit of this conference, which was an experiment, were not to arrive at any weighty conclusions. The results will come through the stimulus of an interchange of ideas and experience between nurses from different parts of the country. Yet each nurse returned home with a new inspiration, a new zest for tackling her own situation, because of this recent contact with others.

All the nurses present concluded definitely that a conference of this kind should be arranged each year; that because of its limitation in numbers, making informality and real interchange possible, it had a value not attainable through conventions.

For the N. O. P. H. N. itself this conference indicated the direction of certain needed services which will help to guide the development of its future program. And it left no doubt, had there been any to start with, as to the interdependence of the national body and these other groups.—N. O. P. H. N. Release, July 1, 1931.

The Frontier Nursing Service—
Six years ago Mary Breckenridge took a two months' horseback trip through

the Kentucky mountains locating the midwives who reported the great majority of the births the preceding year. Later a survey showed it would be energy wasted to try to improve the work of these midwives, who were all grossly ignorant and superstitious and averaged over 60 years of age. Mrs. Breckenridge then took a nurse's training course in New York and a midwife course in London, came back, and started the Frontier Nursing Service, in a Kentucky county in which, for a population of 10,000 people in an area of 50 square miles, there was no resident physician.

The bulk of the cost of the service, the budget for which is \$126,000, is supplied by people from the more prosperous parts of Kentucky through gifts, the remainder from all parts of the United States, and particularly 12 large cities which have Frontier Nursing Service committees.

The service now has 28 nurse midwives, a physician of its own, in co-operation with the state health authorities, with another doctor maintained by a medical mission, and with a dentist for 6 months of the year. The service now extends over an area of 1,000 square miles in the remote Kentucky mountains where there are no railroads, automobile roads or bridges over its rivers and creeks.

There are 9 nursing centers with usually 2 nurses living in each; each nurse has her own district and her work is generalized except that she has had training in midwifery in England besides her public health nursing training. At one center, Heyden, there is an 18-bed hospital and clinic building.

The nurses provide nursing, public health service, and midwifery under medical direction. In addition to the hospital and clinics which are under medical direction the service carries on four types of field work: (1) midwifery, including careful prenatal, and post-

partum care before and after delivery, with a physician called for difficult cases; (2) baby and child hygiene care; (3) bedside nursing care for all ages and ailments; (4) general preventive care coöperating with the Kentucky State Board of Health; under this comes prevention of hookworm, small-pox, etc., chlorinating wells, getting defects corrected among school children, etc.

The nurses all ride horses to get to their cases, and have 33 horses at their disposal. Each nurse has two saddle bags, one in which to keep her general nursing equipment weighing 38 pounds, the other in which she keeps her maternity nursing outfit weighing 48 pounds.

The weight of these is distributed evenly on the two sides of the horse.

The Frontier Nursing Service hopes some time to reach all the isolated and difficult sections of the United States with the same effective work that is being done here in Kentucky. It is not generally realized that from 15 to 20 millions of our population live under frontier conditions in different sections of the country. It is in part because of the poor care available for mothers and babies in these remote sections that 16,000 mothers die in childbirth yearly, and nearly 200,000 babies die at birth or before they are a year old.—Edith R. Solenberger, *Nurses on Horseback*, *Hygeia*, July, 1931, pp. 633-638.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Education-Publicity Headquarters at Montreal—The Committee on Meetings and Publications has set aside a room as a headquarters *for those in any and all sections* who are interested in the spread of information about health activities and education in personal health.

Please write long in advance if you have special material to display.

Copies of printed matter, bulletins, news releases, radio talks and other samples will be displayed in classified portfolios. Address to Montreal Display, Evart G. Routzahn, 130 East 22d St., New York. *Try to send this material during August.* Canadians please note especially.

There will be a table for free samples, *but any taken from the United States should be individually stamped* "Printed

in U. S. A." Will not be passed by Canadian customs unless so stamped.

Dental Hygiene Information Source—The American Dental Association, 58 E. Washington St., Chicago, offers information and materials for educational work according to the following:

The Bureau of Dental Health Education: Offers suggestions and counsel in the promotion of state and community dental health programs. Supplies educational material such as reprints, lectures, talks, posters, slides and films to dentists, hygienists, teachers, nurses and other public health workers. Gives advice and assistance in developing talks and lectures pertaining to dental hygiene for various types of audiences.

The Library Bureau: Circulates dental books and package libraries to members. (Each package library is a collection of periodical clippings, reprints, etc., on one phase of dentistry; over 200 phases have been covered.) Answers questions regarding dental literature.

The Bureau of Chemistry: Investigates old

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

and new dental remedies as presented to the profession and the public. Furnishes chemical data on "secret" formulas.

Publicity Dictionary—John L. Scott, of *Printed Salesmanship*, Chicago, was asked for some definitions:

About the only really authoritative source I could suggest for the definitions about which you recently inquired would be the dictionary. And common usage has, of course, changed the meanings of a number of them according to the dictionary.

The following definitions are my own personal opinions of the meaning for each one and you may take them for what they are worth:

The booklet, pamphlet and brochure I would group together as all being small books, semipermanently bound, the only differences being that a pamphlet has a self cover, the booklet usually has a cover made of something heavier, and the brochure cover is more elaborate and is generally in the form of advertising display.

A handbill is a single sheet printed on one side only, for personal distribution in various ways—house-to-house, by automobile, on street corners, etc.; and a dodger is a small handbill, and a flyer, a small dodger.

A leaflet is a single sheet and may be printed on one or both sides.

A bulletin is an announcement of news or a periodical publication, as the proceedings of a society.

A circular ordinarily has the four-page letter as a basis and is usually found in varying sizes and folds.

A folder is a circular with at least one vertical fold and two horizontal folds but a great many times it has quite a few more folds than these.

"What's On Your Mind?" at Montreal—How could this be done? Where to turn for information? Why was something done this way instead of that way?

Such questions and others will be asked and answered in a luncheon session of the Public Health Education Section. First attention will be given to questions submitted in writing to the editor of this department.

"I Was Never Invited"—To send material for this department, wrote one health worker recently. Will anyone who feels that way please look at the lower left corner of this page—or the same corner in any issue of the *Journal* for a number of years?

Dominion Readers!—We never get enough material for this department from Dominion sources.

Will Canadian readers please note the references to Montreal in this department, copy them, and pass on to local, provincial and Dominion health agencies—public and private?

How to Get Copies—Single copies of most of the publications mentioned in this department *may be secured by writing to the agencies to which they are credited*. Do not expect a city agency to supply free copies for distribution in another city, or a state department to furnish quantities for use in another state.

Usually return postage should be enclosed to private agencies. Although a price is quoted on government publications, in many cases single free copies will be sent if one writes direct to the responsible department or bureau.

Prize Awards for 1931—The Social Work Publicity Council awards include a number of health agency winners:

Envelope enclosure: To Henry Street Nursing Service for a blotter used in raising funds for summer camps.

House organs for lay public: Honorable Mentions to Sunnyslope Sanatorium, Ottumwa, Iowa, and State Charities Aid Assn., New York.

House organs for the staff: first award to Bergen County Tuberculosis and Health Assn., Hackensack, N. J.

Industrial posters: first award to National Tuberculosis Assn. (See under Posters.) Honorable Mentions to the same and to State Charities Aid Assn., New York.

The above and other specimens will be shown at Montreal in September.

Reasons for the awards are given in *News Bulletin*, Social Work Publicity Council, New York, June, 1931.

Please Tell the Editor—Please tell the editor of this department of your successes or failures in getting copies of materials mentioned on these pages from month to month.

Also tell us if you get requests for copies of your publications when they are mentioned in this department.

Newspaper Men Are Like That—A business concern reminds its local branches:

Some newspapermen are hard to get along with. The majority are not. Their average amiability and reasonableness is as high as any business or profession in the world. They don't like servility; they don't like arrogance; they don't like fake. They are brought up in a school which teaches them, as a first lesson of their trade, to spot all such hokum whenever they see it.

Treat your newspapermen respectfully, friendly, honestly, and they will treat you the same way.

A Health Parade in China—June 7 the *New York Times* announced plans for an anti-cholera parade in Shanghai:

The gigantic parade will be a lurid affair, and in an effort to attract the attention of as many hundreds of thousands of persons as possible many kinds of noise will be utilized. Brass bands, drums, a fife and drum corps, gongs, wailing Chinese violins, and even an airplane mounted on a truck with the engine going as loudly as possible will announce the parade's approach and passing.

This hullabaloo is designed to arouse the interest of apathetic Chinese, to instruct them by example on how to avoid the spread of cholera, and to teach them basic ideas of cleanliness in handling food and the ordinary safeguards of decent sanitary measures.

Banners and floats and 1,000 young students shouting through megaphones will emphasize that unclean water, unclean food, unclean fingers, flies and filth are the agencies through which cholera is spread. The coffins will be

labeled as though they contained the bodies of men or women who contracted cholera because of carelessness, and the stuffed dummies on the stretchers will be similarly placarded.

Is it possible that we have become too sane and respectable in attempting to stir "apathetic" Americans—about the rising tide of automobile accidents, for example?

Welfare and Relief Mobilization—This is the title of the inter-community money-raising effort in 370 cities to be conducted, largely under the auspices of community chests, October 19 to November 25, 1931. It is hoped that the campaign will reinforce the efforts of public and private health and welfare agencies to obtain public appropriations and private contributions for two objectives: first, to maintain present activities, and second, to meet conditions growing out of the unemployment situation. Nationally promoted as a coöperative effort, yet it is wholly local in management and in use of funds to be raised.

The central committee invites ideas for promotion and publicity. Statements as to effects of the depression on health are requested. Address Bart Andress, Association of Community Chests and Council, Graybar Bldg., New York. Also send copies of anything you have issued touching hard times and health conditions.

HONORABLE MENTION

To Tennessee Department of Health: for biennial report with table of contents; for the chapter reporting on health education.

MAGAZINE ARTICLES

"The Family Doctor," editorial. *Saturday Evening Post*. July 4, 1931. We need the doctor; what he needs.

"Fewer and Better," editorial. *Collier's*. June 20, 1931. The new birth rate.

"The Hazard of the Automobile," by

Dr. J. A. Tobey, 350 Madison Ave., New York. Reprint from *Scientific Monthly*. June, 1931. *Free*.

"How to be Happy though Vacationing," by L. Clendening, M.D. *Collier's*. June 27, 1931. How to survive vacation—and accidents.

"Is Advertising Honest?" by T. S. Harding. *Nation*. May 20, 1931. Foods, tooth-pastes and "cures."

"Over a High Health Hurdle," by S. G. Blythe. *Saturday Evening Post*. June 6, 1931. Why long life after 63.

"Summer Health Sense," by G. F. Alsop, M.D. *Woman's Journal*, 171 Madison Ave., New York. 25 cents. Also "Birth Control: Yes or No?" by D. D. Bromley. An attempt to state both sides.

"Sunburn—Friend or Foe?" by W. B. Long, M.D. *New York Herald-Tribune Magazine*. July 5, 1931.

"The Swallowed Watermelon," by S. Kerr. *Saturday Evening Post*. May 30, 1931. Yes, it is about health, food fads, etc.

"Take Deep Breath," by H. Durham. *Collier's*. June 20, 1931. "Most of us are only half-aired."

"Too Much Health Advice." *Literary Digest*. June 27, 1931. Copied from *Journal of Indiana State Medical Assn.* "The housewife caught in a maze of vitamins, calories, carbohydrates, and 'acid-producing' foods, and does not know which way to turn."

"Vacation in the Backyard," by M. Fleming. *New York Herald-Tribune Magazine*. July 15, 1931. How to use \$25.00.

POSTERS

Few health posters are truly "posters." In contrast with the many illustrated charts or placards is the new series of 4 issued by the Nat'l Tuberculosis Assn., 450 7th Ave., New York, and available through all tuberculosis associations. Three are devoted to the theme of general health, and may be classified as appeals to children, youth,

and adults (although each may be used for any age group); the fourth is a specific message about tuberculosis to working men and women. 15" by 22"; 4 to 7 colors. *Free folder with black and white copies*. (See Prize Awards.)

Unusually well done is the set of 8 "Child Feeding Charts" prepared by the Bureau of Home Economics, Department of Agriculture. 25 cents a set from Supt. of Documents, Washington. Photographs and limited text; black on white; 15" by 23"; illustrate good food habits and effects of good nutrition. Fewer capital letters in text below the pictures would have increased legibility.

We hope to display at Montreal a group of the health and safety posters issued by the Western Electric Company under the direction of R. T. Barker. It is understood that samples are *not* available.

"Posters and Their Making," by Agnes Smith. *Public Health Nurse*. Sept., 1930. Tells "how a set of 10 posters on health for elementary grades was brought to completion." Emphasizes that—

... if the poster is to be really effective the picture should be so simple that all who see the poster can understand the message without the necessity of any wording. If the maker is sure that this goal has been achieved, then it is quite permissible for a few short words to be added for emphasis, but they cannot be depended upon for the interpretation of the idea. It must be self-explanatory.

NEW

The Playground, 315 4th Ave., New York, is now *Recreation*. New inside and out.

The Public Health Nurse, 450 7th Ave., New York, becomes *Public Health Nursing*. The change follows (but is not the result of) 3 months of diverse shades of blue for the cover page. The final choice is worth looking for.

With July, 1931, *Red Cross Courier*, Washington, D. C., changes from a semi-monthly to a monthly publication.

TIMELY TOPICS

A letter from Charlie Chaplin is quoted in a news release of National Society for the Prevention of Blindness, 450 7th Ave., New York. *Free.*

Pittsburgh's Health, Dept. of Public Health, came out with flags and cover-page text in red and blue. "Carelessness is a human trait, not found in dumb animals" introduces summer hazards.

That "Good eyesight is largely responsible for the making of sport champions" is the theme of a radio talk by David Resnick, National Society for the Prevention of Blindness. *Copy free.*

Usable ideas are better than warnings. At least sunburn warning might be supplemented by such positive information as the following from *The American Girl* published by the Girl Scouts:

Girls who like to be brown-haired but not burned have discovered that rubbing themselves with oil before sun exposure will do the trick. Any oil—olive or mineral. If by accident you get a bad sunburn, you should treat it as you would any severe burn. Minor burning or chapping should be treated immediately with a little oil—use a bit of cold cream or cleansing cream before you wash your face. Calomine lotion—a fine powder liquid which you can buy at the drug store—is a cooling, soothing thing to use for summer irritations such as heat rash, bites or mild sunburn.

"Vacation Hazards"—*Safety Education*, 1 Park Ave., New York. June, 1931. A wealth of teaching ideas for elementary and high schools.

"Vacation Typhoid Fever"—*Missouri Public Health News*, State Board of Health. June, 1931. "Highly civilized communities have very little typhoid fever."

"Does Running Water Purify Itself?"—New York State Dept. of Health. April, 1931. Radio talk. *Free.*

Sanitation in summer resorts, fresh air camps, recreational camps, etc., is covered by a series of articles in *Canadian Public Health Journal*, Toronto. June, 1931. 25 cents.

"Tourist Camp Sanitation" edition of *Iowa Public Health Bulletin*, State Dept. of Health. Jan.-March, 1931.

The Dept. of Health, Ontario, offers educational printed matter and advice touching summer resorts and other recreational facilities, and says:

The Department is at all times willing to assist the Medical Officer of Health in the improvement of Recreational Sanitation within his municipality.

"A New Method of Killing Poison Ivy"—*Health News*, New York State Dept. of Health. Oct. 6, 1930.

"Beware Poison Ivy!"—*Ohio Health News*, State Dept. of Health. May 15, 1931. Good brief statement.

"Prevent Poison Ivy Poisoning"—*Health Briefs*, Tenn. Dept. of Public Health. June, 1931. The source and preventives.

"Avoid Ivy Poisoning by Thorough Washing"—*Woman's Page Miscellany*, Cleanliness Institute, 45 E. 17th St., New York. "According to the Department of Agriculture." *Free.*

"Poison Ivy"—*Scouting*, 1 Park Ave., New York. June, 1931. More detailed description; use of iron chloride.

TELEVISION

Right on the job was the New York State Dept. of Health in presenting March 30 what was probably the first television broadcast of health material.

Then on June 1 the New York City Dept. of Health gave the first combination of television and straight broadcast. The broadcast was the first of a series of talks on weight control in which scientific and medical advice on safe weight reduction methods was

explained each Monday afternoon at 4:45 o'clock during June and July. Audiences could see and hear the talks at Aeolian Hall and 4 department stores.

MOTION PICTURES

Now is the time for taking amateur pictures of summer camps for interpretation and promotion next winter and spring. Argument and suggestions will be found in "Cine Selling for Summer Camps," by E. W. Page. *Movie Maker*, 105 West 40th St., New York. July, 1931. *Sample free*.

Making an Amateur Health Movie, by H. E. Kleinschmidt, M.D. National Tuberculosis Assn., 450 7th Ave., New York. *10 cents*. A 21-page mimeographed pamphlet of practical, working suggestions. Says the introductory paragraph:

The silent movie is being elbowed out of the theater—for better or for worse. But as a means of teaching certain subjects effectively and entertainingly, the silent motion picture retains its unique value. Now is the time to capitalize this educational instrument for teaching health. Owners of cameras and projection machines are increasing in number; the amateur movie is growing out of its toy stage and becoming a serious vehicle of expression. Like the use of the typewriter, the brush, or the piano, the technic of the movie is worth mastering. Here are a few elementary helps and hints.

"Deferred Payment," 4-reel film produced by British Social Hygiene Council, is offered by American Social Hygiene Assn., 450 7th Ave., New York. This film, which deals with syphilis in drama form, has the unanimous endorsement of both lay and professional groups as an effective means of informing the public. Sale or rental.

"Fifty Years of Service to Humanity" is a one reel picture designed especially for this jubilee year of the American Red Cross.

American Social Hygiene Assn., 450 7th Ave., New York, offers 7 pictures

(22 reels) in both 16mm. and 35mm. and at reduced prices for sale and rental.

Special service: If you wish one of the following write the number in () on your business card or letterhead and mail to editor of this department. For each number a new card or letterhead. (*No letter needed.*)

(327)—Catalogue of free industrial and health pictures.

(208)—Catalogue of free industrial pictures.

(54)—Health Movies: How to Use Them, by Dr. H. E. Kleinschmidt. Mimeographed memorandum.

(433)—The Silent Film, by Dr. Iago Galdston. Its value: amateur possibilities. Mimeographed memorandum.

(209)—Catalogue of Eastman Class Room Films—Health Subjects.

(210)—Amateurs now have available a new superspeed 16mm. film. Simplifies picture-taking tremendously according to the description in *Movie Makers*

UNEMPLOYMENT

Under "Tea, Coffee, Cocoa and Other Beverages," *Hygeia* (June, 1931) has a paragraph on symptoms of scurvy and pellagra reported in connection with bread lines. (*Copy free*. Address: 535 N. Dearborn St., Chicago.) Health workers will wish to be ready with information together with helpful minimum diet information issued by Dept. of Agriculture, Washington, and other sources.

Mental Hygiene Bulletin (450 7th Ave., New York, May, 1931) tells about a discussion of mental attitudes as a factor in the current economic slump, a meeting called by Illinois Society for Mental Hygiene. *Copy free*.

Balanced Menus for the Modest Budget—Cleveland Health Council, Federal Reserve Bank Bldg., Cleveland, 2-page letter size sheet. Mimeographed. Well done as to content and inexpensive form. *Free*.

RADIO

Have you had a first aid series via radio? A vacation series—with usable suggestions as to where to go and what to do as well as warnings against what not to do? How to dodge poison ivy? How to get sunburn safely? When typhoid inoculation is desirable?

The past winter the radio talks of Canadian Social Hygiene Council were broadcast in French over CKAC by *La Presse*, which also summarized them in its columns.

Manitoba Dept. of Health and Public Welfare reports:

One gratifying result of sending written copies of the radio talks provided by the department, to those who ask for them—is learning about the various uses that are being made of them. A school principal writes that he keeps them in a loose-leaf notebook on the reading table for his high school pupils. The president of a "Parent-Teacher Association" uses them to prepare for the health discussions that are held at every meeting, etc.

The U. S. Public Health Service will present this month a report on health broadcasting at the international conference on educational broadcasting to be held in Vienna. For this report the following questions were put to state and local health authorities:

(1) Does your department issue broadcasts on public health or personal health subjects? (2) How long have such broadcasts been issued? (3) At what intervals? (4) From what stations? (5) What other agencies, such as medical societies or civic organizations, in your vicinity sponsor material on these subjects for broadcasting? Medical societies were asked—What other agencies, such as voluntary health organizations or civic organizations, in your vicinity sponsor material on these subjects for broadcasting?

The *Journal* question, "Do you do anything beyond straight talks in broadcasting?" is answered by Dr. Lila O. Burbank, Division of Adult Hygiene, Mass. Dept. of Public Health:

Our Radio Health Forum is conducted weekly and is not a "straight" talk since the service consists of questions from the public and answers to them prepared by either physicians of the Massachusetts Department of Public Health or other experts not of the department. Usually a foreword on some phase of public health is given followed by the questions and their answers—about 1,400 words in all. Sometimes some of the questions are answered by mail since the queries are not of sufficient public interest to give over the radio. The practical evidence we have that the broadcasts are listened to is the fact that questions do come in to be answered. We are trying, by substituting questions on health and the prevention of disease for those not suitable for the radio, to educate the people to the kind of questions it is within our province to answer.

Massachusetts has been running three weekly broadcasts: Wednesday at 5:20 p.m. a series jointly sponsored by the State Medical Society; Friday at 12:30 p.m. a State House Broadcast, which included a series of 9 talks on Department activities; and the Radio Health Forum Fridays at 4:50 p.m.

Thanks Due the Editor?—The newspaper editor is a specialist in what people will read in a daily publication. Like all specialists he is not infallible, but as a rule he knows.

The short cut to getting health material into newspapers is via better and better copy. Sometimes editors are too willing to help the health movement and actually print material of doubtful reader interest. Thanks be to the editor when he drops that copy into his waste basket.

When our copy fails to appear we may well believe that it was not readable enough, or that it was kept out by one of the innumerable exigencies which arise hourly in a newspaper office. Any newspaper of any significance receives daily several times as much material as it can use.

BOOKS AND REPORTS

Health on the Farm and in the Village. *A Review and Evaluation of the Cattaraugus County Health Demonstration with Special Reference to Its Lessons for Other Rural Areas—* By C.-E. A. Winslow. New York: Macmillan, 1931. Price, \$1.00.

The book is a comprehensive report of the methods and results of a pioneer experiment lasting over 7 years. In this experiment there was an attempt made to extend the facilities of modern medical science to a rural community. From its nature it should be of interest to public health men and to practical social service workers in rural communities. This latter aspect, i.e., social service, also finds treatment.

The book is written from an optimistic point of view, and the author's economics used in computing returns on the investment in public health are orthodox, even if questionable.

For anyone contemplating an attempt to organize a county health program, this book will offer quite valuable guidance, giving as it does, details of organization and describing machinery for a fairly successful attempt as well as pointing probable obstacles.

The first chapter is a good summary of the outstanding lessons of the demonstration.

ALLEN E. STEARN

How the Nurse Can Help with the Cancer Problem—*For Distribution by the New York City Cancer Committee, 34 East 75th St., New York, N. Y.* 30 pp.

This excellent leaflet begins with a consideration of the control of cancer in general, following which there are articles by specialists on cancer of the skin, breast, and uterus. The longest

article is devoted to "The Nursing Care of Cancer Patients." Its source guarantees the accuracy of its contents.

It is distributed free to nurses and interested groups. M. P. RAVENEL

The Vitamins—By H. C. Sherman and S. L. Smith. (2d ed.) New York: The Chemical Catalog Company, Inc., 1931. 575 pp. Price, \$6.00.

The scientific and technologic monographs of the American Chemical Society series are welcomed by chemists and other scientists for their assistance in coördinating and extending knowledge otherwise available only in numerous journals. The vast amount of research, the complexity of the subject, and the diversified character of the chemical nature of vitamins results in a widespread need for a concise, readable, and accurate presentation, which is here given.

The first edition of this monograph covered practically all the important literature on vitamins to the end of 1921. This edition summarizes the knowledge since acquired regarding the chemical nature of the individual vitamins—their rôles in life processes, their formation and distribution in nature, their relative abundance in different food materials, their stability under different conditions, as well as the processes for their extraction and concentration.

Separate chapters are devoted to each vitamin. The book begins with a General Introduction to the Vitamin Theory.

The complex nature of the vitamin originally known as B is discussed in two chapters. The controversy over the two factors now recognized and the

various approaches to the methods of adsorption, extraction and separation are clearly given. That other factors are concerned in the nutrition of mammals, and may be recognized as additional vitamins, is predicted.

The need of vitamin C in metabolic processes is shown in its antiscorbutic properties, and its effect on teeth and bone formation. Only recently have we known of the comparative antiscorbutic values of the different foods. The determination of the protective dose of vitamin C against scurvy is of considerable interest in that it has been found by some workers that the minimum protective dose for the teeth is almost exactly twice that for protection against the more familiar symptoms of scurvy. If it becomes established that this represents the true difference between tooth and general body requirement, the antiscorbutic values need only be multiplied by 2 to change them into tooth protective values.

Observations on disease resulted in the discovery of vitamins B and C. The failure to secure normal growth in experimental animals on purified food materials gave rise to the conception of fat soluble vitamin A. The term vitamin A, in the monograph, covers both the precursor form (carotene) and the form immediately active in animal nutrition. Both land and water plants synthesize the vitamins, and from them, animals, including fishes, derive their supplies. The intensely yellow carotene synthesized in plants is more or less completely converted into the almost colorless vitamin A in the animal body.

The antirachitic vitamin D is a calcium and phosphorus mobilizing factor, and thus exerts a distinct influence on the anatomic elements of the growing bone, but neither it nor ultra-violet light can replace an actual deficiency in these elements. A ration which produces rickets in rats can be rendered anti-

rachitic by exposing it to ultra-violet light. The production of vitamin D by irradiation of ergosterol is discussed.

The recognition of the distribution in plant and animal substances of vitamin E, its function in maintaining fertility, as well as other knowledge about it, are given in the last chapter. This vitamin is found widely distributed in foods, and only a very small amount is needed for its special function.

The authors have succeeded in presenting in concise form, through selection of experimental evidence, the present status of the knowledge concerning vitamins. An excellent bibliography, as well as an author and subject index are appended. ESTHER W. STEARN

Calidad Bacteriologica de las Aguas de Caracas, Venezuela, S. A., y Metodos Modelo Para el Analisis de Agua y Alcanta-Rillado—Seccion Bacteriologica, 1930. Caracas, S. A. 50 pp.

Dr. E. I. Benarroch publishes the results of the bacteriological analyses of the waters of the public supplies in Caracas, Ven., S. A. Although incomplete, as the author states in his paper, these analyses give a thorough idea of the poor quality of water in Caracas. A brief summary in English is published.

The second part is a fairly good Spanish translation of the Bacteriological Section of the *Standard Methods for the Examination of Water and Sewage* (6th ed.), 1925, published by the A. P. H. A.—Some words like "fiola" are not used in pure Castillian and must be changed.

This translation is to be recommended to Latin-American laboratory workers and a complete translation into Spanish of the whole *Standard Methods* is desired.

En un folleto de cincuenta páginas, el Dr. E. I. Benarroch publica los resultados obtenidos de los análisis bacte-

riológicos de las aguas de los abastos públicos de Caracas, Venezuela, América del Sur, con los que, aunque incompletos como el mismo autor lo indica, se puede tener una idea clara de la mala calidad de esas aguas, desde el punto de vista bacteriológico.

La segunda parte del folleto es una buena traducción de la Sección de Bacteriología, de los Métodos Modelo para el examen de aguas y alcantarillado—6a. edición 1925—publicados por la Asociación Americana de Salubridad. En su lectura se encuentran algunas palabras como "fiola" que no son usadas en castellano puro y deben ser cambiadas.

Este trabajo es de recomendarse a los laboratoristas latino-americanos y es de desearse una traducción completa—de los Métodos Modelo que ayudará a la unificación de los procedimientos de análisis de las aguas.

A. DE LA GARZA BRITO

The Home Care of the Infant and Child—By *Frederick F. Tisdale, M.D.* New York: *William Marrow & Co.*, 1931. 292 pp. Price, \$3.00.

This is a very attractive and well conceived book in which prenatal and infant care are combined in the one volume. Modern procedures, based upon the scientific work of the last two decades, are set forth in simple understandable language for the average mother.

The book is printed so as to be accessible for ready reference. Each topic is treated with just enough fullness to be explicit, but is not overdrawn. Excellent illustrations add to the practical value of the book. The first three parts deal with prenatal and neonatal care, the care of the baby during the first year of life, and care of the older child.

A feature of this book which should prove especially helpful to mothers and fathers is the last section dealing with special problems such as accident prevention, behavior problems, and the play

life of the child. This book is recommended to parents who desire definite, scientific consideration of their children's health problems. R. A. BOLT

First Aid for Boys—A Manual for Boy Scouts and for Others Interested in Prompt Help for the Injured and the Sick—By *Norman B. Cole, M.D., and Clayton H. Ernst.* (rev. ed.) New York: *Appleton*, 1931. 192 pp. Price, \$1.50.

This is an excellent guide for Boy Scouts as well as older persons. It is written in language which is easily understood and the directions for first aid are sufficiently clear to be understood by all.

It can be commended for its announced purpose. M. P. RAVENEL

Untersuchung der Nahrungs- und Genussmittel. Allgemeine Methoden—By *Dr. Wilhelm Plücker.* Berlin: *Urban & Schwarzenberg*, 1931. 1046 pp., 295 figs. in text. Price, bound, M. 59.

Tabellen- und Rechenbuch für Nahrungsmittelchemiker. By *Dr. Wilhelm Plücker.* Berlin: *Urban & Schwarzenberg*, 1931. 231 pp. Price, bound, M. 22.

These two works which are also incorporated in *Abderhalden's Handbuch der biologischen Arbeitsmethoden*, Abt. iv, Teil 14, cover the field of food chemistry in an exhaustive manner. The entire field is covered except the determination of molecular weights and the detection of preservatives, treated elsewhere in the *Handbuch*. The opening sections deal with general procedures. Biological methods follow, including the detection of arsenic, the precipitin reaction for honey, and serological methods in the separation of cereals, vegetable oils, horse fat, and the various sugars. The chemical methods elaborated in great detail are concerned with the volatile oils, al-

cohols, aldehydes, ketones, esters, and acids, with the amines, amino acids, albumins, nitrogen-free extractives, coloring matters, fats, carbohydrates, lipoids, mineral matters, rarer bases and acids, and water determination. The physical methods discussed include agitation, extraction, colorimetry, distillation, dialysis, decolorization and clarification, extraction of solids, filtration, fluorescence, freezing point, critical solution temperatures, conductivity, microanalysis, nephelometry, solubility, polarization, refractometry, spectroscopy, crystallization, determination of melting and boiling points, specific gravity, ultrafiltration, viscosity, and hydrogen ion concentration.

There are lists of reagents for the various fields of analysis and a very fully worked out book of tables and computations for the many types and forms of analysis.

The work is up-to-date, gives the pros and cons for alternative methods, and suggests fields in which improvements in current practice are needed.

CHARLES A. KOFOID

Correction: In June *Journal*, page 704, a review of *Facts and Figures About Tuberculosis* stated that the book was published by the New York Tuberculosis Association. This should have been National Tuberculosis Association.

BOOKS RECEIVED

BIOLOGY IN HUMAN AFFAIRS. Edited by Edward M. East. New York: McGraw-Hill, 1931. 399 pp. Price, \$3.50.

DETERMINATIVE BACTERIOLOGY. Vol. II. By K. B. Lehmann and R. O. Neumann. New York: Stechert, 1931. 868 pp. Price, 2 vol., \$12.50.

ESSAYS ON MARRIAGE. By Frederick M. Harris. New York: Association Press, 1931. 208 pp. Price, \$2.00.

FUNDAMENTALS OF HEALTH. By T. Bruce Kirkpatrick and Alfred F. Huettner. New York: Ginn, 1931. 576 pp. Price, \$3.80.

SEEING. A PARTNERSHIP OF LIGHTING AND VISION. By M. Luckiesh and Frank K. Moss. Baltimore: Williams and Wilkins, 1931. 241 pp. Price, \$5.00.

CLINICAL DIETETICS. A Textbook for Physicians, Students and Dietitians. By Harry Gauss and E. V. Gauss. St. Louis: Mosby, 1931. 490 pp.

THE INFANT WELFARE MOVEMENT IN THE EIGHTEENTH CENTURY. By Ernest Caulfield. New York: Hoeber, 1931. 203 pp. Price, \$2.00.

THE STORY OF HEALTH. By Hope Holway. New York: Harpers, 1931. 150 pp. Price, \$1.25.

KANSAS CITY HEALTH AND HOSPITAL SURVEY. Prepared by The Committee on Administrative Practice of The American Public

Health Association and the Kansas City Public Service Institute. Kansas City, Mo.: Chamber of Commerce, 1931. 329 pp. Price, \$2.00.

INDUSTRIAL ACCIDENT PREVENTION. A Scientific Approach. By H. W. Heinrich. New York: McGraw-Hill, 1931. 366 pp. Price, \$4.00.

AMERICAN PHYSICIANS AND SURGEONS. Edited by James Clark Fifiield. Minneapolis: Midwest Co., 1931. 1737 pp. Price, \$30.00.

ACCIDENTAL INJURIES. By Henry H. Kessler. Philadelphia: Lea & Febiger, 1931. 718 pp. Price, \$10.00.

TEXT-BOOK OF MEDICAL DISEASES FOR NURSES, INCLUDING NURSING CARE. By Arthur A. Stevens and Florence Anna Ambler. Philadelphia: Saunders, 1931. 503 pp. Price, \$2.75.

THE HOME AND THE CHILD. Subcommittee on Housing and Home Management of the White House Conference on Child Health and Protection. New York: Century, 1931. 165 pp. Price, \$2.00.

INTERNATIONAL STUDIES ON THE RELATION BETWEEN THE PRIVATE AND OFFICIAL PRACTICE OF MEDICINE WITH SPECIAL REFERENCE TO THE PREVENTION OF DISEASE. Vol. II. By Sir Arthur Newsholme. Baltimore: Williams & Wilkins, 1931. 249 pp. Price, \$4.00.

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Baltimore, Md.—This city, with an estimated population in 1929 of 841,728, records a birth rate of 16.6, the white rate being 15.1 and the negro rate, 25.2. The total death rate was 13.8, that for the white being 12.2 and for the colored, 23.1. Comparative data for births, deaths, and for specified causes of death, by color, are given for previous years. In 1929, a tuberculosis death rate of 79 was recorded for the white, as compared with 316 for the colored population.

We have found it very profitable in our health work not only to carry the advantages of education to the public as a whole, but also to our working forces in the field. The response, by the workers in the several bureaus where Book and Journal Clubs have been formed, has been highly gratifying to their chiefs as it has not only benefitted the field worker but also the directors themselves by increasing their breadth and depth of views of their own special ties.

The laboratory reports indicate that several special investigations of a research nature were conducted, as well as routine work.

In connection with a diphtheria immunization campaign, it is noted that two circular letters were addressed to physicians asking for their coöperation and suggesting that the health department supply the toxin-antitoxin. Communications were sent to all life insurance companies to encourage them to have their agents speak to parents about the procedure. Over 140,000 pamphlets *Your Child Looks to You for Protection* were placed in the hands of the Police Department and were distributed by them in homes in the city. The trolley cars placed T-A-T sign cards in every car to go with an article by the health officer and a list of clinics in *Trolley*

News. Immunization clinics were organized and their work was followed up by a Schick team of physicians.

Brookline, Mass.—In the 1930 annual report, a population of 47,730, a birth rate of 11.2, and a death rate of 11.88 are noted. Deaths from heart disease lead the list of causes of death, and number 28 per cent of the total. There were 16 cases of diphtheria, but this was the seventh consecutive year with no deaths from this cause. Of 644 school children Schick tested, 43 per cent were found to be immune to diphtheria, while 467 children previously given toxin-antitoxin were re-tested and 63 were found to be still susceptible and were again given the protective inoculations. In addition, 132 infants were given toxin-antitoxin at the community health center.

There were 17 deaths from tuberculosis with 28 new cases reported (62 in 1929). At 87 clinic sessions, 640 chest examinations were made of 249 individuals of whom 111 were new patients. There were 2,718 home nursing visits made in behalf of tuberculosis cases.

A health bulletin of a popular character is published quarterly and distributed by the Police Department to every house in town. This bulletin serves to inform residents of the quality of milk sold and gives publicity to various health activities conducted in town.

Pittsfield, Mass.—This city of 49,677 population presents an interesting health department report which shows an infant mortality rate of 40.5 for 1930. During the year the Chadwick Clinic made possible the examination of over half the school children, the

Von Pirquet test preceding the X-ray and physical examination. Cases of hilum tuberculosis thus found are sent as rapidly as possible to Westfield for treatment. All retail raw milk, as well as milk for the largest pasteurizing plant, is obtained from tuberculosis free herds. The activities of the health department have been rated by the health officer on the *Appraisal Form* of the American Public Health Association. and show a weighted score of 776 points.

New Jersey—For the fiscal year ending June 30, 1930, the New Jersey Department of Health reports the lowest annual case and death rates from typhoid fever on record for the state, together with an absence of large outbreaks of communicable diseases. There were 16 cases of typhoid fever traced to raw milk. One member of the dairyman's family, who bottled the milk, was found to be a carrier.

Public health services included bacteriological examination of 65,987 specimens for physicians and health officials, an increase of 10 per cent over the previous year. Nearly half of these specimens were for the Wassermann test for syphilis. Diphtheria prevention in rural communities depended largely on the assistance of the department in organizing clinics, arousing public interest, and in giving Schick tests after the toxin-antitoxin treatments were administered by local physicians. There were given in this manner Schick tests to 10,144 persons and toxin-antitoxin to 5,558 individuals. Nurses reporting to the department assisted in giving toxin-antitoxin to 16,465 school children and to 11,388 preschool children.

Transition from policeman to teacher has affected both the work and point of view of health officials. So true is this that nearly every activity of the State Department of Health attempts more or less directly to instruct, interest and lead local officials and citizens to do the right thing for their own well-being and that of their neighbors.

New Britain, Conn.—On the basis of a population of 69,000, a death rate of 8.4 is calculated for 1930. Of 88 infant deaths (rate of 66.6) 50 were among infants under one month of age. A health department expenditure of \$.51 per capita is noted. The health officer recommended in his annual report the transfer of garbage collection from the health department, and the inauguration of a diphtheria immunization campaign. The public health laboratory showed an increase in examinations of 38 per cent over the previous year.

Schenectady, N. Y.—An infant mortality rate of 46, much lower than usual, is reported for 1930. Based on a population of 95,652, a general death rate of 11.2 is recorded. In contrast with last year, there has been a falling off in the amount of milk and cream sold in the city. This is believed to be largely due to the depression. A congenital clinic is maintained, to which 11 first visits and 79 revisits were made. Attendance at the tuberculosis clinic numbered 1,228. Other clinic services included prenatal, child hygiene, cardiac, and dental. Among the health officer's recommendations are noted expressed needs of a health education director, a social service worker at the health center, and improved facilities for the care of mental disease cases.

San Diego, Calif.—Tuberculosis control activities among dairy herds, under the supervision of the State Department of Agriculture, resulted in the testing of 12,567 animals. There were 85 reactors to the tuberculin test. A new milk ordinance was passed providing the same standards from outside dairies supplying San Diego as from those in the city and county.

On the basis of a population of 149,423, a birth rate of 16.9 and a resident death rate of 11.1 are reported. The infant mortality rate in 1930 was

49.3. There were 74 deaths in the city resulting from automobile accidents. Of this number 57 were from accidents which took place within the city limits. There were 1,384 personal injuries resulting from motor vehicle accidents occurring in the city, as compared with 1,042 the previous year.

The California school code requires that instruction be given in elementary and secondary schools on the subjects of public safety and accident prevention. A 195 page book, *Course of Study in Safety Education*, published by the automobile club of Southern California, is used in this connection.

Edmonton, Alberta—Edmonton reports for 1930 a general death rate of 6.8 and an infant mortality rate of 48.9, both low records. Cancer was the leading cause of death with heart disease and tuberculosis following in order. This city of 80,000 people reports only 9 cases of diphtheria, with no deaths from this disease, "an outstanding proof of the value of the diphtheria prevention treatment carried out in recent years."

A summer camp was organized by the Kinsmen's Club for childhood contacts of tuberculosis cases, and a graduate nurse was in charge of the six weeks' camp. Under the direction of the Provincial Department of Health, 2 child welfare clinics were held weekly with an attendance of 5,286, an increase of over 600 over the previous year. A course of 16 lectures on public health topics was arranged for the benefit of the staff and others. This report contains an excellent organization chart showing the community health services.

Prevention of Blindness—The co-operation of a wide diversity of organizations throughout the United States in the steadily expanding movement to prevent blindness and conserve vision is emphasized in the sixteenth annual

report of the National Society for the Prevention of Blindness.

The society realizes more than ever that it can function completely only when it is working closely with all agencies interested in any aspect of saving sight—medical, educational, social welfare, and industrial.

It has been the constant aim of the society to encourage and participate cooperatively in the field of research into the causes of blindness. Among the major causes are glaucoma and trachoma, both of which, it is felt, can be appreciably reduced.

Continuing the study undertaken in coöperation with the Massachusetts Eye and Ear Infirmary and Harvard University Medical School on the effect of adequate social service follow-up in connection with glaucoma patients, the number of glaucoma cases now registered in the clinic at Boston is perhaps greater than ever registered in any glaucoma clinic. There has been also a continual demand for the society's special pamphlet on glaucoma.

The granting of \$250,000 by the Commonwealth Fund permits Washington University, St. Louis, to undertake study of the etiology and control of trachoma. It is felt that once the real cause of trachoma is definitely established, it will be possible to wipe out a great cause of blindness which affects almost every country in the world. The society is called into consultation with those working on the trachoma problem, and there is a constant demand for its literature.

As part of its White House Conference project, the society compiled information and statistics on existing legislation providing special classes for conserving the sight of school children and offering financial aid for their maintenance. A special report was given to the Sub-Committee on Special Classes for Education of the Blind and Partially Seeing Children, on all phases of sight-saving classes—growth, health of the pupil, methods of administration, supervising, teacher training and vocational guidance.

The formulation of a "Program for 100 Per Cent Eye Protection in Industry" has been begun. This, when it has been completed, will be presented in the form of a self-appraisal for safety engineers and other executives concerned with the conservation of vision in industry. It is the opinion of the society and of numerous safety engineers consulted in the matter that such a program intelligently and conscientiously applied to even the unusually hazardous industries will help considerably to eliminate industrial eye

accidents, one of the most serious causes of blindness.

During the year, through the auspices of the Medical Social Service Section of the Welfare Council of New York City and the Associated Out-Patient Clinics, a committee on development of social service in eye clinics was formed. This committee, of which several staff members of the society are members, arranged a series of study conferences on eye diseases and defects of especial interest to medical social eye workers.

In conjunction with the American University at Cairo, Egypt, the society sponsored a two-reel motion picture which points out the importance of care of the eyes early in life, treatment of trachoma, and methods of protection against industrial eye hazards. It also assisted the Near East College Association by preparing a complete set of exhibit material for a health education program in Syria.

The report indicates a continued reduction in the amount of blindness resulting from ophthalmia neonatorum, usually called "babies' sore eyes," and attributes this to the use of prophylactic drops in the eyes of babies at birth, as required by law in most states. The number of "sight-saving" classes for school children with defective vision has grown to 375, but several thousand more are needed.

Approximately 500,000 of the society's publications were distributed during the year, staff members lectured in more than 100 cities in 21 states, and nearly 25,000 letters were sent in answer to inquiries from all parts of the country regarding a large variety of technical and general problems connected with the preservation of good eyesight.

Trenton, N. J.—Credit is due this city for a carefully prepared and well printed annual report for 1930. Among the outstanding developments of the year are noted the establishment of a mental hygiene clinic, the promulgation

of a new ordinance regarding the sale on the streets of certain manufactured foodstuffs, and a provision for the reporting to the Health Department by physicians of persons bitten by a dog, cat, or other animal in connection with the state act for the "Prevention and Control of Rabies."

Up to the end of 1929, the Schick test was given to 12,571 public school children. Of this number, 6,571 were inoculated with toxin-antitoxin, 6,151 gave a negative reaction, and 1,843 were treated without having been previously Schick tested. Of 1,235 previously treated children who were re-Schicked, 1,046 gave negative reactions. Another group of 3,701 previously treated school children were re-Schicked and 2,915 gave negative reactions. In addition, 4,153 parochial school children have been given toxin-antitoxin. This report is well illustrated with statistical tables and charts.

Marion County, Ore.—Following an organization chart and a personnel statement, the 1930 report of the Marion County, Ore., Department of Health lists in a comprehensive manner 15 community health services. An effective cut from the A. P. H. A. *Syndicated Health Bulletin* with the caption, "Ounces of Prevention," directs attention to the economic losses due to illness which may be prevented.

For the calendar year, the lowest infant mortality rate for the county (36.4) is recorded, together with an increase in the number of young children protected from diphtheria, the passage of a modern milk ordinance for Salem, marked improvement in venereal disease control, and an honor rating for Salem in the Inter-Chamber health conservation contest of the U. S. Chamber of Commerce. This report of 23 pages illustrates the value of good headings and subheadings and careful preparation.

Kansas—The 15th biennial report of the State Board of Health of Kansas for the period ending June 30, 1930, opens with an organization chart showing the official activities and listing 6 cooperating agencies. Several charts and reproductions of health posters awarded prizes in the high school contest add interest to the report. The diphtheria eradication program has resulted in the administration of toxin-antitoxin to not less than 340,000 children besides an estimated number of 110,000 protected by private physicians. A change in deaths from diphtheria by age groups is noted for a period of years, 68.6 per cent in 1928 being in children under 10 years of age as compared with 80.7 per cent for the 10-year period 1916-1925.

The lowest death rate from tuberculosis of 35.1 was recorded in 1927, and the second lowest of 38.2 in 1929. The Health Department and Other Reports second lowest infant mortality rate of 57.3 was recorded in 1929, the lowest rate, 54.1, having been noted in 1927. At the close of the fiscal year 1930, 11 counties in the state were operating under the plan of full-time health protection. Two schools for health officers and public health nurses were held during the reported period. These were made possible through the cooperation of the U. S. Public Health Service and voluntary agencies.

Bermuda—A very interesting report of the health and sanitary conditions of Bermuda has been prepared for the year 1930 by the Director of the Medical and Health Department. This report shows that, except for an epidemic of measles,

the year was a reasonably healthy one. Most of the measles cases were mild. There were 54 cases of diphtheria reported, with 9 deaths. Of the total cases, 27 were white persons, and 26 were persons under 18 years of age. In 1929, 1,730 children were given immunizing treatments against diphtheria, and only one of this number subsequently developed the disease. "An outbreak of diphtheria does but half its damage outright. It leaves bacilli tucked away in the noses or throats of its previous victims or of people who have been in contact with them." Emphasis is given to the importance of immunization measures.

There were 8 cases of typhoid during the year, with 1 fatality. In seeking the source, a carrier was discovered. There were 13 cases of tuberculosis reported and 11 deaths from this disease. In the construction program of the King Edward Hospital is a new isolation building which may also accommodate the few tuberculosis cases needing hospitalization.

The population of 31,211 is made up of 16,400 colored and 14,811 white persons. The area of Bermuda covers 19.5 square miles. During 1930, there were 565 births among colored and 224 among white persons, giving a total birth rate of 25.2. A general death rate of 9.99 is recorded, with an infant mortality rate of 76.

Active control measures against the breeding of rats, mosquitoes and flies are described. An active program of health education in schools has been instituted. It is also gratifying to note a movement for several dairies to cooperate in the pasteurization and delivery of milk.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON. PH. D.

Health Status of Negro Industrial Employees—Among a group of 1,000 negro factory workers, over 900 were found to have serious physical defects, and all but 3 would profit by early medical care.

ALLEN, F. P. Physical Impairment Among One Thousand Negro Factory Workers. *J. Indust. Hyg.*, 13, 5: 157 (May), 1931.

The Lubeck Disaster—Was a culture of virulent tubercle bacilli added to the BCG stock, or did BCG recover its virulence under the cultural methods employed in the Lubeck laboratory? This question remains unanswered in what seems to be an unprejudiced review of the regrettable affair. "The moral, however, is plain. The preparation of vaccines for large-scale distribution should be undertaken only under the most rigidly controlled conditions in laboratories set aside for this and for no other purpose."

ANON. The Lubeck Catastrophe. *Brit. M. J.*, 3674: 986 (June 6), 1931.

Refuse Incineration—Fundamentals of furnace design, plant location, and operating procedures are touched upon to serve as a guide to municipalities facing refuse incineration projects.

BARTLEY, R. J. Factors in the Incineration of Community Refuse. *New York State J. Med.*, 31, 11: 679 (June 1), 1931.

Pasteurized Milk and Nutrition—To counteract raw milk propaganda based upon unscientific evidence, this committee quotes several studies which find pasteurized milk the nutritive equivalent of raw milk, and urges the U. S. Public Health Service to settle the question once and for all.

BROWN, E. G. Report of Committee on

Milk. *Pub. Health Rep.*, 46, 25: 1455 (June 19), 1931.

Tuberculosis Prevention Today—Reviewing the newer knowledge of tuberculosis, the author points out reasons for the present-day emphasis on the prevention of childhood infection, the improvement of child health, and to this end, the general betterment of health education.

GALDSTON, I. The Newer Aspects of Anti-Tuberculosis Work. *New England J. Med.*, 204, 25: 1303 (June 18), 1931.

Next Steps in Child Hygiene—Beginning in the field of sanitation, child health has passed through the same stages of development as other health promotional activities, the goal being stated in the findings of the White House Conference.

HAINES, B. M. The Maternal and Child Hygiene Program of the Future. Where and How Shall the Emphasis be Placed? *Pub. Health (Mich.)*, 14, 6: 123 (June), 1931.

Epidemiology of Undulant Fever—Evidence is presented indicating a high incidence of past *Brucella* infections in persons, not in contact with cattle, presumably transmitted by raw milk. Highest ratios were found among veterinarians, farmers and meat packers.

JORDAN, C. F. Infection in the Epidemiology of Undulant Fever in the General Population and in Selected Groups in Iowa. *J. Infect. Dis.*, 48, 6: 526 (June), 1931.

Diphtheria in Two Large Cities—This statistical study of diphtheria mortality rates in Philadelphia and New York shows the 1930 rate in both cities too far below the anticipated level to be attributable to chance. The relation-

ship of rates and age grouping considered in the light of immunization practices is significant.

LEE, W. W. Diphtheria Immunization in Philadelphia and New York City. *J. Prev. Med.*, 5, 3: 211 (May), 1931.

Avoiding Health Nostrums—"In general leave your health alone. . . . You can influence it a little more than you can influence the weather, but not much more. . . . There is no better general guide to food choice than healthy hunger." Why do writers feel called upon to travel the route indicated by these quotations in order to warn against quackery and health nostrums?

LYON, E. P. *Science and Health*. Graphic Survey, 66, 5: 265 (June), 1931.

Why Cancer Clinics?—The opportunities of the cancer clinic made clear for the intelligent public. Well done.

MATTICK, W. L. The Value of the Cancer Clinic to the Community. *New York State J. Med.*, 31, 11: 696 (June 1), 1931.

Faulty Nutrition Results—"Properly fed animals remain remarkably free from disease; improperly fed animals are remarkably subject to it. It is reasonable to assume that the human species is no exception to this rule." Words of wisdom concluding a scientific demonstration conducted at the other side of the world.

McCARRISEN, R. Some Surgical Aspects of Faulty Nutrition. *Brit. M. J.*, 3674: 965 (June 6), 1931.

Body Mechanics—Functional health is greatly influenced by body mechanics and poor posture can be converted into good by adequate training, so says this article.

OSGOOD, R. B. *Body Mechanics and Posture*. *J. A. M. A.*, 96, 24: 2032 (June 13), 1931.

Rural Children's Health—Sampling rural children the country over, this survey finds the West and Northeast ahead in health and dental examinations and immunizations. As a whole the rural children are woefully unprotected against smallpox.

PALMER, G. T. *Preventive Medical and Dental Service for Preschool Children*. *Child Health Bull.*, 7, 3: 87 (May), 1931.

Rural Health Service—For combined health districts in rural and suburban Massachusetts, the minimum program includes communicable disease control, child health, sanitary inspection, statistical records and health education. The organization necessary for this service is discussed.

SCAMMAN, C. L., and KNOWLTON, W. K. *Health Service for the Small Community—Its Development in Massachusetts*. *New England J. Med.*, 201, 23: 1184 (June 4), 1931.

Health Work in 1950—A British M. O. H. embarks upon a flight into the future to describe the work of the sanitary inspector of 1950. We should like to see the effort of some American sanitary Jules Verne on the same subject.

SYMONS, A. D. The Metamorphosis of Martha or Leaves from the Life of a Sanitary Inspector. *Med. Off.*, 45, 23: 264 (June 6), 1931.

Streptococcus Studies—A demonstration illustrating the impossibility of separating by available methods the streptococci associated with septic sore throat and scarlet fever into definite groups related to the particular type of infection.

WHEELER, M. W. *Streptococci Associated with Epidemic Septic Sore Throat; Their Relationship to Streptococci Associated with Scarlet Fever*. *J. Prev. Med.*, 5, 3: 181 (May), 1931.

NEWS FROM THE FIELD

BELGIAN CHILDREN ORPHANED BY INDUSTRIAL ACCIDENTS

A LAW recently enacted in Belgium provides for a national bureau for the care of minor children who have lost the support of the family breadwinner through industrial accident. The bureau is directed to supervise in their behalf the enforcement of the child welfare laws, especially the administration of pensions awarded under the workmen's compensation law and of their property in general, to give pecuniary aid or aid in kind when needed; and to watch over their general education and vocational training.

The bureau is to be represented by local committees in the Provinces and cities. Through these committees welfare visitors of suitable education, experience, and character will be appointed to advise the child's mother or guardian and to supervise the child's general well-being. These visitors will serve without remuneration. Women are preferred for the work in the case of young children.—*Oeuvre Nationale de l'Enfance*, Revue Mensuelle, Brussels, Feb. and March, 1931.

FIRST NATIONAL CONGRESS ON SOCIAL SERVICE FOR CHILDREN, ARGENTINA

THE first national congress on social service for children in Argentina will be held in Buenos Aires, September 20 to September 26, 1931.

Its purpose is to study the various problems of child welfare and methods of their solution. Among the subjects mentioned in the program are: Treatment of the defective and delinquent child; effect on child of the mother's employment outside of the home; training of social workers; establishment of

a council of social agencies and of a social service exchange in Buenos Aires.

The president of the congress will be Dr. G. Araoz Alfaro, President of the National Department of Hygiene.—*Boletín de la Oficina Sanitaria Panamericana*, Washington, May, 1931.

POWDERED MILK FOR PORTO RICO

FOLLOWING suggestions by Dr. S. J. Crumbine, Prof. H. C. Sherman, and other scientists, that one of the greatest public health needs of Porto Rico is an adequate supply of American canned milks, employees of The Borden Company of New York have donated 2,700 pounds of Klim Powdered Whole Milk for this purpose. This shipment, equivalent to nearly 11,000 quarts of fluid whole milk, will be distributed to the child welfare stations in Porto Rico. At these stations Klim has been used for infant feeding for more than a year, but lack of funds has recently caused the closing of a number of the clinics.

HOMICIDES IN NEW YORK

THE number of homicides in 1930 in the State of New York, 698, and the rate per 100,000 population, 5.5, were the highest ever recorded. As compared with 1929, the number of homicides in New York City increased from 425 to 494 while in the rest of the state there was a drop from 220 to 204.

AMERICAN HOME ECONOMICS ASSOCIATION

THE American Home Economics Association held its 24th annual meeting, June 22-27, in Detroit, Mich., with an attendance of 1,500.

Among the speakers were Dr. F. J. Kelly, Chairman, Education Section,

White House Conference; Prof. John Sundwall, University of Michigan; Francis C. Davis, Merrill Palmer School; Wells A. Sherman, U. S. Bureau of Agricultural Economics; and Edith Hale Swift, American Social Hygiene Association.

Mary P. Connolly, Director, Division of Health Education, Department of Health, Detroit, attended the meeting as official representative of the A. P. H. A.

SOUTH CAROLINA MILK

THE Borden Company has decided upon establishing a large plant to manufacture powdered milk somewhere in South Carolina. This decision is due to a recent conference between Dr. L. J. Auerbacher of the Borden Milk Co. and Dr. William Weston, Director of the South Carolina Natural Resources Commission.

Dairy studies have proved that South Carolina milk contains a high content of iodine and other properties especially beneficial to children.

WALTER BURNS SAUNDERS MEMORIAL MEDAL

THE third award of the Walter Burns Saunders Memorial Medal for outstanding service to nursing will be made in April, 1932, at San Antonio, Tex., during the convention of the three national nursing organizations. The first award was made posthumously at the biennial convention of 1930, to S. Lillian Clayton, former President of the American Nurses' Association, and the second presentation of the medal was made to Mary Sewell Gardner of Providence, R. I., in May, 1931.

CANADA-UNITED STATES RECREATION CONGRESS

THE Canada-United States Recreation Congress will be held in Toronto, October 5 to 9. This is the

eighteenth such gathering sponsored by the National Recreation Association, but the first in Canada where progress in public recreation has been rapid during the past 10 years.

The Earl of Bessborough, Governor General of Canada, has agreed to serve as honorary patron of the conference, and Richard B. Bennett, Prime Minister of the Dominion, is the honorary president.

THE HOME AND THE CHILD

AN ANNOUNCEMENT is made of the publication of *The Home and the Child*, covering the findings of the Subcommittee on Housing and Home Management of the White House Conference on Child Health and Protection. This volume of 165 pages presents the recommendations of the subcommittee in regard to housing, furnishings and equipment, the management of home activities, the management of income, and clothing. It is published by The Century Co. The list price is \$2.00.

ASSUMPTION PARISH CHILD HEALTH CAMPAIGN

A PARISH-wide meeting was held in Napoleonville, La., for the awakening of interest in ways and means of correcting defects found in school children during the past school year. Arrangements were made for a bus-load of children to be transported to Charity Hospital on each of four dates during the summer for tonsillectomies.

GORGAS ESSAY CONTEST

HELEN DALE, a recent graduate from Point Loma Junior-Senior High School in San Diego, Calif., was awarded the Charles R. Walgreen Prize of \$500 for the winning essay in the Third Annual Gorgas Memorial Essay Contest. The subject this year was "Keeping Fit: The Gorgas Program of Personal Health."

AMERICAN RED CROSS ROLL CALL

THE Fiftieth Anniversary Roll Call of the American Red Cross, to enroll members for 1932, will be held from Armistice Day to Thanksgiving, November 11 to 26, 1931.

CHINA'S PUBLIC HEALTH

PLANS for the development of public health education in China, in which W. W. Peter, M.D., Dr.P.H., Fellow A. P. H. A., is serving temporarily as technical expert, are published in the June issue of *The Cleanliness Journal*.

Dr. Peter, who was at one time associate secretary of the American Public Health Association and is now director of Health Service of Cleanliness Institute, is on 8 months' leave of absence at the request of the Chinese Government. Previously he spent 15 years in China and was director of the China Council on Health Education.

MOBILE HEALTH UNIT

A MOBILE health unit is the latest in health activities in West Virginia. The unit consists of a trained public health officer and a public health nurse. Under the present plan this unit will visit those counties in the state where there is no established health work, with a view to organizing committees and putting on a demonstration which will not only show the citizens the value of health work but will also give the rural children the same health protection which is being given others in the state. Dr. R. H. MacLeod has been secured as head of this unit.

NATIONAL SOCIETY FOR PREVENTION OF
BLINDNESS APPOINTS NEW
DIRECTORS

THE National Society for the Prevention of Blindness has announced three new appointments to the Board of Directors—Dr. John M. Wheeler, Professor of Ophthalmology in the Medical

School of Columbia University, Mary Antoinette Cannon, of the New York School of Social Work, and Dr. A. B. Meredith, Professor of Education at New York University.

INTELLIGENCE OF DRUG ADDICTS

DRUG addict prisoners who have committed offenses against the United States, and who are no longer taking drugs, show, according to preliminary studies of the U. S. Public Health Service, a greater proportion of above average intelligence than is observed among non-addict prisoners.

Among the drug addicts studied, 30 in every 100 were above average in intelligence, whereas 18 in every 100 prisoners not addicted to the use of drugs were above the average in intelligence. On the other hand, 17 in every 100 drug addict prisoners were considered to be normal but of dull intelligence, whereas 1 in every 10 addict prisoners was mentally defective and 1 in every 6 among the non-addict prisoners was mentally defective.

MALNUTRITION AND ECONOMIC
DEPRESSION

TO students of public health the increase in disease as the result of unfavorable economic conditions has long been known. In this city we have been watching for evidence of the effect of the current economic depression, and we have already observed an unfavorable influence on the incidence of tuberculosis.

A survey of the health of school children recently completed affords another example of the influence of the economic depression. The survey included 2,835 school children examined for evidences of malnutrition in 15 public schools in the Borough of Manhattan. The findings were compared with the results obtained in the examination of 1,881 children in these same schools in 1929. In 1929 the examination of 1,881 children

showed 19 per cent to be suffering from malnutrition; in 1930 the examination of 2,835 children in the same schools showed 25 per cent to be classed as cases of malnutrition.—*Weekly Bull.*, Dept. of Health, City of New York, XX, 16 (Apr. 25), 1931.

TRICHINOSIS

TWO farmers in the western part of the State of New York bought a 320-pound hog and had it butchered. The day after they made it into sausages and they and members of their families sampled the raw sausages and again when partly cooked on that day. These farmers also sold some of the sausages to a number of nearby families during the next 10 days to 2 weeks.

An outbreak of 24 cases of trichinosis followed. Besides the two farmers who had purchased the hog, members of their own, as well as of 8 other families, contracted the disease.

The symptoms were those of gastrointestinal disturbance, together with rise in temperature, edema of eyelids, and deep-seated muscular pain. A high eosinophil count was also reported. *Trichinae* were found on biopsy and also on microscopical examination of part of the sausage and of the head of the hog.

Thorough cooking of all pork and pork products is the only sure safeguard against contracting trichinosis.—*Health News*, May 11, 1931, New York State Dept. of Health, Albany, N. Y.

DENTISTRY IN AMERICA

WITH 67,000 dentists, 1 to every 1,700 persons, America leads the world in dentistry and dental training, according to the Office of Education, U. S. Department of the Interior, in spite of the fact that it has been estimated that only one-fourth of the American people receive dental service.

Thirty-eight institutions in the United States offer professional training in den-

tistry, 31 of which are rated Class A, 6 are rated Class B, and 1 is unclassified. The first dental school in the world was Baltimore College of Dental Surgery, which gave instruction leading to the D.D.S. degree and graduated 2 students in 1841.

PERSONALS

DR. SHIBASABURO KITAZATO, noted bacteriologist of Tokio, Japan, died June 13. He was a member of the American Society of Tropical Medicine, of the International Society for Scientific Research, and was honorary president of the Japan Medical Society.

MRS. FRANCES RICHARDSON BIGGS, widow of the late Dr. Hermann M. Biggs, former New York State Health Commissioner, died suddenly of heart disease May 30.

Mrs. Biggs shared actively in her husband's concern for the protection of the public health. She was president of the National Federation of Day Nurseries and vice-president of the Stony Wold Tuberculosis Sanatorium at Lake Kushaqua. She was an Associate Member of the American Public Health Association.

E. G. EGGERT, formerly of the Texas State Department of Health in Austin, is now Assistant Engineer, Georgia State Health Department, Albany, Ga.

DR. W. T. HENSHAW has been reappointed State Health Commissioner of West Virginia, as announced by Governor William G. Conley.

NEW HEALTH commissioners in Ohio include a change in a general health district and an appointment in a new city under the 1930 census. Dr. Henry R. O'Brien, Lorain County, at Oberlin, succeeds Dr. C. D. Barrett; and James Hobson is the Health Commissioner at Mingo Junction.

DR. W. F. DRAPER has recently been appointed by Governor Pollard of Virginia as the new State Health Commissioner of Virginia. Dr. Draper succeeds the late Dr. Ennion G. Williams, who for over 25 years served as the Health Commissioner of the state and died June 6.

DR. HAIM YASSKY, who has been serving as Acting Director of the Hadasah Medical Organization in Palestine, has recently been appointed Director.

DR. EUGENE LYMAN FISK, medical director of the Life Extension Institute of New York and a pioneer in public health promotion work, died unexpectedly in Dresden, Germany.

Dr. Fisk had been medical director of the Life Extension Institute since its organization in 1913 as a result of a movement headed by former President William H. Taft. Professor Irving Fisher, of Yale, and Harold A. Ley. He has been a member of the A. P. H. A. since 1915 and became a Fellow in 1922.

WILLIAM S. KEISTER, M.D., of the Maryland State Health Department, died July 3.

Since his graduation from Johns Hopkins Medical School in 1914 Dr. Keister had served with distinction in the U. S. Public Health Service and in various state health agencies. He has been a member of the A. P. H. A. since 1913.

CALVERT L. ESTILL has become director of the West Virginia Department of Public Welfare, which was created by the last legislature.

JOHN A. THABES, M.D., of Brainerd, Minn., has been elected President of the Minnesota State Board of Health.

DR. HARRY A. REESE, Health Officer of Yuma, Ariz., and member American Public Health Association, was appointed President of the Arizona State Medical Association at its annual meeting, May 7, 1931.

LEO STEIN, formerly vice-president, has been elected president of the New York League for the Hard of Hearing, Inc.

CONFERENCES

July 27–August 2, The World Federation of Education Associations, Denver, Colo.

August 3–8, International Congress of Industrial Accidents, Geneva, Switzerland.

August 3–8, International Dental Congress, Paris, France.

August 31–September 4, International Neurological Congress, Berne, Switzerland.

September 7–8, International Association of Preventive Medicine, The Hague, Holland.

September 7–10, International Congress for Studies Regarding Population, Rome, Italy.

September 14–17, Sixtieth Annual Meeting, American Public Health Association, Montreal, Canada.

September 20–26, Argentina First National Congress on Social Service for Children, Buenos Aires, Argentina.

September 23–30, Centenary Meeting of the British Association for the Advancement of Science, London, England.

October 5–9, Canada-United States Recreation Congress, Toronto, Canada.

October 12–16, Nineteenth Annual Safety Congress and Exposition, Chicago, Ill.

October 19–23, American Dental Association, Seventy-Third Session, Memphis, Tenn.

November 9–14, the Ninth Texas Sanitarians' Short School, Houston, Tex.

July, 1932, The Second International Conference of Social Work, Frankfurt, Germany.

American Journal of Public Health

and THE NATION'S HEALTH Vol. XIII No. 9

Volume XXI

September, 1931

Number 9

The Certification of Laboratories in California*

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THE fact that there are many untrained, inexperienced and incompetent technicians daily performing laboratory tests, the outcome of which may be a matter of life or death for some patient, is not generally appreciated. The work of such technicians is sentencing some patients to unnecessary anti-syphilitic treatment, allowing others who should be treated to go without treatment, or helping other patients to an unnecessary abdominal operation through a false blood count, and generally confusing the diagnosis for the doctor who seeks light on obscure conditions.

In the public health laboratory, such technicians release contagious cases and carriers, or place in quarantine persons who are not a menace and should not be detained. Any way one looks at it, it is a serious matter that such important service should have no safeguards whatever.

If a blacksmith's apprentice wants to treat the sick for pay, he must take a medical course lasting years; even if he wants to be a chiropractor, he must take some sort of course and procure some sort of license, but if he wants to make laboratory diagnoses for physicians and their patients—literally engage in one phase of the practice of medicine—all he need do in most places is buy some equipment, or get a job and go to work.

The need for protection of the people, their physicians, and the health departments against a low standard of service in this important field, is evident to every competent laboratory man, and to every phy-

* Read at the Meeting of the Western Branch, American Public Health Association, Seattle, Wash., May 29, 1931.

sician who is himself sufficiently in touch with laboratory methods to recognize ignorance and charlatanism, when it appears in the guise of diagnostic laboratory service; for there are charlatans as well as incompetents in diagnostic laboratories, as there are in the general field of medicine. Physicians curiously enough do not seem to appreciate that this problem exists. They apparently do not apply to their laboratory technicians the same reasoning regarding the necessity of adequate education and experience that they apply to themselves. It is doubtless to be explained by the lack of thought and attention that is given this specialty of medicine by the profession in general. Whatever the explanation, it is a fact that less concern is shown by the average individual physician in routing his specimens to a laboratory, and by the average group or hospital in employing a laboratory worker, than to almost any other type of service of which they make use.

The influences that determine the physician's choice of a laboratory are without doubt generally the same that influence patients in selecting their physicians. For some patients, the doctor's sign on the door is sufficient, and for some doctors the statement of the applicant for a job that he or she is a bacteriologist or that he or she is fresh from the laboratory of some hospital, is sufficient. True, the former job may have been that of dishwasher, but this unfortunately may not be gone into. Others may be more cautious; they may require the recommendation of someone else no more qualified than they, to decide on the technical qualifications of the seeker after employment or referred business. Some will pursue the course adopted by a very few patients in choosing their physicians, and in the absence of any official certifying agency, seek the advice of someone who has special knowledge in that particular line.

Such things as personal appearance, convincing manner, a "line of patter" suggesting technical knowledge, a pleasing personality, are very effective in "selling" the laboratory worker to the physician; while the fact that a technician without previous training cannot become competent by working in a laboratory for a period of only 2, 4, or 6 months, is usually lost sight of.

An education in the basic sciences of chemistry, bacteriology, biochemistry and pathology is almost as necessary as for the practice of medicine, and even after the best of college courses, experience under competent supervision is necessary. The average physician, health officer, or hospital executive is not prepared to pass on the qualifications of a technician, and therefore must have some method of distinguishing the competent from the incompetent.

When such facts become common knowledge among physicians,

and others having the selection of directors of laboratories and technicians, both for public health and for clinical work, there will no longer be a problem. Until that time, it seems incumbent on those having a knowledge of the facts, and who are at the same time in a position to improve conditions, even in a limited way, to take such action as their judgment dictates.

My interest in the matter of dependable laboratory service was first aroused as a result of my observations while acting as State Epidemiologist in conjunction with my work as director of the State Laboratory. Later, while executive officer of the department, I tried to get a bill passed by the legislature to establish a licensing system for all diagnostic laboratories, both public health and clinical. This plan was distrusted by the medical profession, at least that part of it which took any interest at all in what was going on in the legislature, and it met the active opposition of certain commercial laboratories. I saw it was no use and dropped the matter entirely, but it seemed as though something should be done. Waiting for improvement through a growing appreciation of the situation on the part of the medical profession, would be like waiting for the millennium. If the doctors had waited for the people to learn that they should, in their own interest, have state licensure of physicians, there would as yet be no restriction on the practice of medicine and surgery. Likewise, waiting for the laboratories themselves to clean their own houses while perhaps promising more, still, seemed too far in the future. Such a waiting policy had no appeal.

Finally, in 1923, we decided to try a voluntary system of approval of laboratories, intending at first to limit our field to public health. Sanction of the State Board of Health was secured, and the work was started, using printed forms patterned after those of New York State, in their work of subsidizing laboratories for public health work. This plan met with a very favorable reception from the local public health laboratories, and when a few clinical laboratories asked for certification, they were included.

In the operation of this plan, an application for certification is followed by a personal visit to the laboratory. The applications are made in writing, on a special form provided by the department. Questions are answered regarding educational qualifications and experience of the director, the number of employees, the physical equipment of the laboratory, types of work performed, etc. The applicant also agrees to keep careful records of work done, including the preservation of certain stained slides, for a definite period, and to submit to inspection as required.

It has not been considered necessary or advisable to require particular methods of examination, but if the method in use is not considered a safe or effective one, approval is withheld unless a satisfactory method is adopted.

Under the regulations of the board, the director of a laboratory, if not the owner, must have full authority to control the policy of the laboratory so far as technical matters are concerned. The records that are required to be kept are those pertaining to the examination of specimens, such as results, name of patient and of doctor who submitted the specimen, etc. The recording system must also be such that any particular specimen can be readily found and connected up with the case.

Financial matters, fees for examination, etc., are not inquired into. Changes affecting the directorship, removal of laboratory to new location, or radical changes in technic, must be reported to the director of the State Laboratory. A change in directors cancels the certificate of approval.

Such was the system at the beginning, with no examinations of either director or technicians, no requirement of the medical degree for directors of clinical laboratories, no inquiry into the quality of their work in the clinical field. It soon developed that certain local public health laboratories could not be approved, although the local health officer desired that his laboratory be so recognized. In one particularly flagrant case, the health officer was unable for political reasons to make the changes recommended. It was clear that some form of compulsion was necessary. Another bill was drafted, and with the previous experience fresh in mind it was made very brief, very general, and limited in application to the public health laboratories. Following is the wording of the law which was passed in April, 1927:

MUNICIPAL AND COUNTY LABORATORIES

(Act approved April 29, 1927)

1. Any incorporated city, town, county, city and county or chartered city may, for the purpose of protecting the community against infectious disease, establish a bacteriological and chemical laboratory for the examination of specimens from suspected cases of disease and for the examination of milk, waters and food products.
2. The cost of establishment and maintenance of such laboratories shall be a legal expenditure from any incorporated city, town, county, city and county or chartered city funds that may be provided for disbursement under the direction of the health officer for the protection of public health.
3. All municipal and county laboratories established for the purposes herein set forth shall be subject to the approval of the state board of health.

The Board then passed the following set of resolutions for the enforcement of the act:

REGULATIONS FOR THE CONDUCT OF LABORATORIES

WHEREAS, Chapter 282, Statutes of 1927, requires the State Board of Public Health to supervise the bacteriological laboratories maintained by cities, cities and counties, counties and towns, the following requirements are hereby established for the operation of such laboratories:

1. The certificates of approval heretofore issued to laboratories on a voluntary basis shall be required to be in the possession of all city, city and county, county and town public health laboratories and no such laboratory shall continue to operate more than 5 days following receipt of notice of cancellation of any existing certificate, or of refusal of the board to issue a certificate in the first instance, except on temporary extension granted for cause by the Director of Public Health.

2. All skilled workers in municipal or county public health laboratories including bacteriologists, serologists, technicians or laboratorians shall possess, as the condition for such employment, certificates of proficiency issued by the State Board of Public Health.

3. Examinations either written or oral or both for the certificate of proficiency shall be held from time to time in such geographic centers of the state as will best suit the convenience of the majority of the applicants or as may be designated by the Director of Public Health.

4. Examinations for certificates of proficiency shall be under the supervision of the Chief of the Bacteriological Laboratory, State Department of Health.

5. Two grades of certificates shall be issued, one for bacteriologists and one for serologists. Workers possessing one certificate only shall not be permitted to engage in the activities covered by the other certificate, excepting under the immediate supervision of some one possessing the requisite certificate.

6. Health Officers of municipalities or counties possessing no laboratory, but who desire local laboratory service, may designate a local, private laboratory as the official public health laboratory of their territory, but any such designation shall be subject to the approval of the State Board of Public Health, and all skilled workers in such laboratories entering such contract shall hold the appropriate certificate or certificates of the State Board of Public Health.

Adopted by the California Board of Public Health in regular session on the 12th day of November, 1927.

This law with the regulations has accomplished its purpose, for although it has happened that a city has been reluctant to follow the demand of the board that an incompetent technician be displaced, the matter has never been carried to the courts, from which I judge that legal advice has been to the effect that the board has full power under the act.

As a preliminary to the inauguration of the certification of technicians, I visited all the approved public health laboratories in January, 1928, and gave an oral examination to the various technicians, and certificates of proficiency of either junior or senior grade were

issued. Thereafter, all examinations have been written, and have been held at advertised places and times. The system of calculating credits for the certificate is designed to encourage the taking of college courses in preparation for a laboratory career, but at the same time to take care of the practically trained person if he or she is really competent.

A recent graduate, even after the best of courses, still lacks something that can only be obtained by a season of practical experience which may however be rather short if taken in a laboratory doing a great deal of work, and in association with other good technicians. Therefore, the credit given for a college course is hardly sufficient, even with a good examination paper, to secure the senior grade certificate, which entitles the holder to engage in work unsupervised. Credit for practical experience, on the other hand, is not so great as to make it easy for a worker with only a couple of years' experience to get the senior certificate. One-half of the final credits are represented by the paper, one-third by experience, and one-sixth by relative capacity, so-called. The latter is arrived at in a personal interview.

On a basis of 100, 1 year's experience gives a credit of 40, 2 years' of 50, 3 years' of 60, 4 years' of 70, 5 years' 80, 6 years' 90 and 7 years' 100. The experience must be in a laboratory providing the proper kind and quality of experience for the certificate in view. Credit for college degrees is as follows: A.B. (or B.S.), with a major in a subject directly related to the field covered by the certificate, 3 years.

If, in addition to the academic course required by the major, a special advanced or postgraduate course approved for this purpose is taken, a credit of 5 years is given. If, in addition to this last, a period of 3 months is spent as a voluntary assistant in a laboratory particularly designated for that purpose, a total of 7 years or 100 per cent is given.

The basis for approval of clinical laboratories was at first the same as for public health laboratories. Later, it was required that the director of a clinical laboratory should have the M.D. degree, and it was further decided that the endorsement by the Board of Health of a clinical laboratory should be supported by actual knowledge of the qualifications of the technicians employed therein, since their supervision in some laboratories is not very close. The certificate of proficiency in biochemistry, including general clinical laboratory work was therefore established and also a certificate in parasitology.

Until recently, certificates have not been required of workers in laboratories that are under the direction of a doctor of medicine who is specializing in this field and devoting his whole time to the work.

After January 1, 1933,* however, all approved laboratories whether clinical or public health must display at least one senior certificate for each of the divisions of laboratory work that may be undertaken, and all persons on the staff, except medical directors and apprentices, must hold either a senior or junior certificate for the particular kind of work they are required to do.

SUMMARY

Since 1923 the California State Board of Health has issued to certain laboratories, both clinical and public health, certificates of approval.

In 1927, the possession of such certificates of approval was made compulsory for the official public health laboratories of the state. Among other requirements, an approved laboratory must employ certified technicians.

Certificates of proficiency are issued to individual workers after written examination, and special credit is given for college degrees and practical experience.

Certificates of proficiency are issued in 2 grades, junior and senior, and of 4 different kinds, to take care of the varying scope of work in different laboratories. The 4 certificates are in bacteriology, serology, parasitology and biochemistry, the latter covering all activities not included under the other 3.

* Resolution of the Board of Health, Apr. 11, 1931.

Medical Service in Public Schools in Turkey

A RECENT ministerial decree in Turkey provides, evidently for the first time in that country, medical service in secondary schools, which are attended by children mostly between 13 and 16 years old. Each pupil must be examined at the beginning of the school year and at least once more during the year, and a detailed report about each must be sent to the school principal. The examining physician is expected to decide whether the pupil is able to follow the studies without physical or mental harm. A health record is to be kept for every pupil. Pupils with certain defects are to be put on special registers and to be kept under observation. The school physician is also required to watch the sanitary conditions in and around the school building and to give to the school children frequent lectures on hygiene.—*La Législation Turque*, Editions Rizzo, Stamboul, 1931, N. I.

Important Factors in Directing the Health of the College Woman

ESTHER WAGNER STEARN AND GRACE RAND MITCHELL

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IN an article appearing in this *Journal*,¹ Dr. R. W. Bradshaw discusses the problem of student health as a new science. He stresses the unique opportunity in the student health service for research as offered in the field of health appraisal, disease prevention, nutrition, mental hygiene, and epidemiology. Already statistics exist and it may appear not unwise to probe somewhat deeper into the active life of the student, to determine if so-called natural unfitness occasioned by disturbances, considered minor and unalarming, are not of greater importance than is generally recognized.

The physical examination of students entering college serves to eliminate the physically unfit as well as to detect defects in those who matriculate, with the aim of providing remedial as well as protective measures. The records of this school show that it serves this purpose. However the absence of ill health does not imply that the condition of perfect health prevails. Symptoms which call for or even permit a physical consciousness on the part of an individual are often considered by students as legitimate excuses for the avoidance of exertion. These same symptoms however are regarded as natural in the developmental cycle and therefore are relegated to the inevitable and unalterable, no matter how distressing and devitalizing. Such notions are paradoxical.

A recent survey shows that specific factors incapacitate the woman student. The most common symptom of organic disturbance is headache. Studies of 225 girls, whose ages vary from 16 to 21 years, show that 78 per cent complain of headaches. The frequency varies from three times a week to twice a year. Eighteen per cent of these have headaches not less often than once a week. In 71 cases the doctors have named as many as 14 different causes. Eyestrain, nervousness, worry and stomach trouble are listed as main causes. In 41 cases, eyestrain has been diagnosed as the cause. In the other cases no attempt at diagnosis has been made. The cause is not eliminated and the girls supply their own remedies. Fifty-one per cent of these girls use aspirin, others use pills, laxatives, soda water and the like. Some

rest and discontinue study. The survey shows that a great deal of time is lost through headaches, despite the fact that regular habits of work, recreation and rest are enforced.

Another symptom which has been intensively studied by medical men is growing pains. It is recognized as a form of rheumatism caused by some focal infection, and statistics show that heart trouble is more commonly found in those whose history shows rheumatism. Dr. L. F. Barker and Dr. Norman B. Cole² state that "from 80 to 95 per cent of heart trouble in young people is due to rheumatic fever." They further state that the fleeting pains known commonly as growing pains were not until recently looked upon as manifestations of rheumatic infections. They stress the importance of examination, at regular intervals, of teeth, tonsils (which even when removed may grow again), nose, ears and the whole respiratory tract, to insure that they have not become focuses of infections.

The survey shows that 56 per cent of the 225 girls have their teeth examined twice a year, and 25 per cent once a year. The others do not do so at all regularly. Six per cent claim they never have had their teeth examined and cleaned by a dentist.

One hundred thirty-three girls had growing pains at some time. Of these 13 per cent still suffer from them. Our study further shows that 47 per cent of the 225 girls have had their tonsils removed but that in 6 per cent of those who had growing pains there is at present a recurrence of the pains. Of the 58 per cent of girls whose tonsils have not been removed 11 per cent of those who reported growing pains still have them. This shows that a smaller number of girls in the latter group, and a far greater number in the former have lost this symptom of focal infection.

Another form of organic disturbance lies in abnormal menstruation, where this period is of excessive duration, the pain unduly great, and the loss of vitality excessive. Doctors seem to agree that a normal woman should not be incapacitated for work during the menstrual period. The survey shows that this condition of normality is not universally true. Fourteen per cent of the girls remain away from classes regularly during some part of the period, while 34 per cent take drugs to deaden the pain. The majority have periods extending beyond the 5-day limit, and 63 per cent complain of pain. Twenty-four per cent do not have a definite menstrual cycle. About 21 per cent go to the infirmary for part of the time. We may compare this condition with a statement by Dr. Clelia Mosher³: "The best developed women who have come under my observation have a period of not more than 2 or 3 days, free from pain, and in many cases are at their maximum effi-

ciency every day in the month." Dysmenorrhea is thought to be caused by bad posture, poor muscular development, constipation, and chest instead of abdominal breathing. Dr. Mosher stresses the importance of exercise for the normal woman and that for her there should be no suffering and no incapacitating effect of this normal physiologic process.

Colds cause a greater loss of time and efficiency than any other sickness. Little is known about the prevention of colds other than that proper care of the body—that is, proper food, sleep, bathing, avoidance of prolonged exposure, absence of obstructions in nose and throat—increases the body resistance to it, and that care in preventing the spread of nose and throat secretions will lower the incidence. In a school where rules provide for the hygienic modes of living, and sanitary conditions prevent the spread of infectious material it may seem strange that as high as 34 per cent suffer from frequent colds and another 18 per cent occasionally do so.

The question arises as to the possible relation of dietary habits to this frequency of colds. Seventy-two per cent of girls are hungry between meals and eat more or less regularly between meal times. The majority gain in weight. Two measures for prevention of colds that are usually mentioned are avoidance of overeating, especially sweets, and constipation. This study bears out such relation by showing that a higher percentage of those who do not have colds have regular habits of evacuation; that is, of those who have occasional colds 20 per cent, and of those who have frequent colds 35 per cent suffer from constipation. Of those who do not suffer from colds only 16 per cent are constipated. Depression, headache and lassitude accompany attacks of constipation and thereby add to the menace from this factor.

It may be significant to compare the data relative to a group of 25 students with superior ability to 25 with inferior ability. Of the first group 32 per cent diet to reduce weight and of these 75 per cent are subject to colds. Of the second group 36 per cent diet to reduce weight and of these all are subject to colds. Of the entire 225 girls, 36 per cent diet to reduce weight.

It has been known that injudicious dieting, not regulated by a knowledge of the essential food elements nor the advice of a physician not only increases constipation but that the subsequent lowered resistance increases the susceptibility to tuberculosis.

The above is interesting from the standpoint that the school has an enviable record of good health when good health is interpreted as the absence of contagious disease. Rules of the school and its equipment and staff provide for regular and nourishing meals, sleep, proper

ventilation, supervised recreation, instruction in corrective gymnastics, and hygienic modes of living. At the same time the symptoms of physical discomfort as testified to by students themselves, by absences from classes while remaining in the infirmary, and by poor response at times on the part of students of good mentality call for further inquiry. Reference to the factors employed by students on their own initiative shows several interesting facts.

Thirty-two per cent use cathartics advised by physicians. We quote from Drs. Smiley and Gould: "To begin the habitual use of laxatives and cathartics at college age is extremely unwise, because the great majority of cases of constipation occurring at that age are preventable or curable by means much more physiological." Fourteen per cent take a cathartic fairly regularly.

Sixty-eight girls take some kind of medicine for coughs, liver, colds, malaria, stomach trouble, heart, nerves, sinus trouble, dysmenorrhea and vitality. None take reducing pills but 36 per cent diet to reduce weight. One hundred and forty-nine girls take aspirin. Of these, 116 take it to kill headaches, 41 for menstruation, 20 for colds, 1 for hay fever, 13 to produce sleep, 3 for nerves and 2 for heart.

This survey indicates:

1. Only a few, i.e., 18 out of 225 girls, take tonics. Contrasting this condition with the general use of tonics 20 years ago we are forced to believe in the great physical improvement of the college woman. This improvement is due in part to the increased activity and the non-constrictive clothing of the modern woman. Dr. Mosher⁵ says: "An extraordinarily close correlation was found between the fashion of dress and the menstrual condition of women. As the skirt grew shorter, narrower, and lighter in weight, and the waist grew larger, the functional health of women improved."

2. Since a large number of girls still suffer from, and are incapacitated by, headaches, growing pains, dysmenorrhea, and colds, there remains the necessity for earlier training in proper health habits than is at present provided for most girls, especially since these ailments are thought to be corrected by such means.

3. Since more time is spent in the infirmary by students with low I.Q. than by others, an intensive study of such students should be made in terms of their health habits.

4. A closer coöperation between educators and physicians as well as hygienists is advised in the attempt at explaining and correcting the factors which make for inferior mental response. In connection with the above findings resulting from the survey it was thought worth while to compare certain of the data furnished by students of high I.Q. (as measured by a psychological examination for high school graduates and college freshmen), with those of low I.Q. To obtain as great differentiation as possible, out of the 225 cases for which data were at hand, the 25 individuals with the highest score (276-180) were compared with the same number with the lowest score.

It was found that 48 per cent of the high score group never go to the infirmary while only 28 per cent of the low score group are this fortunate. Twenty-four per cent of the former group are subject to colds as compared to the 40 per cent of the latter. Forty-four per cent of the former suffer from headaches, while 64 per cent of the latter do so. Of the 36 per cent of the low score who diet to reduce, all are subject to colds and do not have daily defecation, while of the 32 per cent of the high I.Q. who diet only $\frac{3}{4}$ of this number have colds and only $\frac{5}{8}$ fail of daily defecation. However, 90 per cent of those in the low score are hungry at other than meal times, a condition reported by only 65 per cent of those in the high group. Three times as many individuals of the low score use cathartics as do those of the high score.

In all phases of active interest the individuals with high scores show pronouncedly greater activity. More time is spent in study, in extra-curricular activity, in physical training, in leadership work by those in the high scores.

From this study which has taken into account habits of bodily care, modes of relaxation as well as the simplest factors in maintaining physical and mental health, there arises the problem of correlation of cause and effect in those students who enter college mentally inferior and handicapped by low vitality. Is this sluggish response to be related to maladjustment in early life? to focal infections? to the presence of intestinal parasites such as ameba? or to hookworm which produces the symptoms of anemia, malnutrition and mental retardation?

In conclusion, the authors wish to point out that the accepted standards of physical examination of the college student by medical men must be supplemented by closer examination of physiological processes and we must not be contented with the detection of defects in the mere mechanisms of the body.

REFERENCES

1. Bradshaw, R. W. Research in Student Health, *A. J. P. H.*, 19: 1229, 1929.
2. Barker, L. F., and Cole, Norman B. *Rheumatism and Its Menace*, Appleton, 1926, p. 31.
3. Mosher, Clelia. *Personal Hygiene for Women*, Stanford University Press, Stanford, Calif., 1927, p. 16.
4. Smiley, D. F., and Fould, A. G. *College Textbook of Hygiene*, Macmillan, 1928, p. 136.
5. Same as 3, p. 27.

Public Health Organization*

KENDALL EMERSON, M. D.

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New York, N. Y.*

I HAVE travelled across the continent for the express purpose of bringing to the Western Branch the greetings of the American Public Health Association on the occasion of this, your second Annual Meeting. It is a long journey. Each time I take it I am reminded of the old story of the Englishman who spent several months seeing the varied sights of our great country. When about to sail for home he remarked that it did not seem at all surprising to him that Columbus had discovered America. The wonder would have been if he had missed it.

And each time I come I appreciate more fully than before that there is something which you people have out here which we miss in the East. I am not going to try to define it. Call it the pioneer spirit if you will. The fact remains that there is an enthusiasm, a spontaneity, a self-reliance which we of the more formal and older parts of the country recognize and envy in you, your loyalties, your energy, the keenness with which you go about your enterprises, such as this extraordinarily interesting and highly scientific meeting you are putting on here in Seattle at the moment. We need your contagious buoyancy. Yet we are not willing to admit that there may not be things we have back East which you need too. After all, this is one country, though a big one; its needs are more or less common needs; certainly its public health program is not a sectional matter but one which interests all parts of the land equally, and draws us all very close together in a common bond.

So as a representative of the parent organization I bring to you of the Western Branch most cordial greetings, heartiest congratulations on this splendid meeting, best wishes for your continued growth in strength and for your increasing influence for good on the health and welfare of the states of the Pacific Coast and the Rocky Mountain region. Back there in New York you may always count on our lively sympathy with your ideals and aspirations, and, what is more impor-

* Abstract of address at a dinner session at the Second Annual Meeting of the Western Branch, American Public Health Association, at Seattle, Wash., May 29, 1931.

tant, our constant readiness to be of every possible aid to you in this great common task upon which we are all engaged.

Tonight I propose to speak to you very briefly on the somewhat broad topic of public health organization. I shall confine myself to a limited phase of that topic, the relation of the official to the volunteer health organization. This is a peculiarly American problem, an outgrowth of our democracy, and would have little pertinence as a subject for discussion in a more centralized form of government.

Speaking broadly, there are just two forms of government, the despotic and the democratic. Of course they shade into each other but as examples of the rather extreme types we may take on the one hand the absolute rule of the small Communist party in Russia or the single despot, Mussolini, who now controls Italy; and on the other these United States of ours consisting of 48 empires loosely held together by a federal government whose impossible duty it is to interpret and satisfy the separate desires of 120 million rugged individualists. If a dictator decrees vaccination, even the conscientious objector bares his arm. But the free born American citizen, if he chooses, may bear the proud scars of smallpox throughout his independent life, a monument to his ignorance and blind self-conceit.

In a democracy, successful public health service must, of course, have legal sanction, but far more than on that it must depend on an educated public with which to work. Now at best public health officials and workers are limited in number. Their administrative and technical duties leave little leisure for the slow and painful process of educating public opinion. You are fully aware of the millions spent each 4 years in an attempt to make the voters of this country think republican or think democratic. There are no such resources at the command of the public health service, though it would be far more profitable if this money spent politically could be turned into the productive channels of health. In a democracy, then, the problem of the public health requires a different mode of handling from that possible to absolutism.

As an illustration you will perhaps permit me to speak of the National Tuberculosis Association as the volunteer health organization with which I am most familiar. It was started 27 years ago by a group of keen visioned public health physicians who recognized that the preventive medical knowledge even of that day was not beginning to be used because the people had not been taught to want it. Nor was the public health service equipped with means to do the teaching. A great popular educational program was needed and this the association undertook. Its first step was to make the organization one of

both physicians and laymen, a wise provision since the latter are sometimes more acceptable as teachers than are physicians of whose motives the public is inclined at times to be suspicious.

The scheme worked even better than its founders had hoped, and other similar organizations were developed. Now it must be remembered that in the beginning the idea originated from public health men and as an aid to the more rapid application of preventive medical principles. Like many a good sword it had two edges. In some localities the influence of the volunteer organization outran the resources of the official health department. Rather feeling its oats the volunteer association sometimes took a community leadership which should have been the prerogative of the health official. Not infrequently it was unreasonably critical rather than constructively helpful. The health officer quite properly resented this, and certain echoes of ancient and most unfortunate clashes are still audible today.

But speaking for one volunteer association I can assure you that those days are over. The value and success of a state or local tuberculosis association is measured at the national office in terms of how far it has integrated its program with that of the official department with which it is in touch. Just in proportion as it is recognized as an arm of the official service just so far it is approved. The health officer is sought as an active member of its Board of Directors. No enterprise is undertaken without his full knowledge and coöperation. His requests are commands to the full extent permitted by the limitations of the organization's resources. When the official department is equipped to carry on without our aid we transfer our duties and seek new ones. If the time comes when the resources of the official health service are adequate we will go out of business. The time is far distant however, as many a harried health officer will testify.

Before concluding I want to take up one other matter. Due to the fact that I have assumed the Acting Secretaryship of the A. P. H. A. while still Managing Director of the N. T. A. whisperings have arisen that an amalgamation might be foreshadowed between the two organizations. Nothing could be farther from the truth. It is impossible in the nature of things. Oil and water won't mix and in both form and purpose the two associations are strikingly dissimilar. The N. T. A. is primarily an operating organization. True we do some research work and hold an annual scientific meeting on the subject of tuberculosis. But our primary aim is the maintenance of our field operating service as an adjunct to the official health service. In general this is true of the other volunteer health associations.

On the other hand the A. P. H. A. is primarily a scientific society

composed of the professional workers in their chosen field. Its own members are doing the public health field service of the country under federal, state and local auspices. There is no call for the Association to undertake field operations. But there is every need for a central scientific body in this great profession to represent its interests before the public mind, to carry on a vast amount of research, to set and maintain standards of work, and to act as an expert appraiser of work actually being accomplished. Through its publications and its meetings it is the great clearing house for the newest thinking of the best minds in the profession in all its varied branches. Its future strength lies not in amalgamation with outside associations but in a far closer integration of its many complex branches, a broader realization that with its varied specialties it is still one great profession, one body of many parts, but a body that will survive only as a whole.

The American Public Health Association has an honorable history of now sixty years. Abroad it is looked upon as by far the greatest organization of its kind. Its strength lies in the united strength of the public health workers of America. Enrollment as a Fellow is the crowning recognition of professional achievement.

Chicago Claims of Low Tuberculosis Death Rate Challenged by Sydney, Australia

IN the City of Chicago *Bulletin Nos. 10, 11, and 12*, the claim is made:

For the first time in the history of Chicago, this city in 1930 achieved the lowest death rate from tuberculosis of any city in this country or abroad.

Following this is a list of American cities, headed by Chicago with a death rate of 66.61 per 100,000, representing a decrease of 20 per cent since the taking of office by ex-mayor William Hale Thompson.

Sydney, the largest city of Australia, with a population December 31, 1930, of 1,250,560, had a death rate of 51.30 per 100,000 from all forms of tuberculosis, and a death rate from pulmonary tuberculosis of only 46.08.

The general death rate for Sydney in 1930 was 8.71 per 1,000, the infant mortality rate (deaths of infants under 1 year) was 49.9 per 1,000 births. The average death rate for the previous 8 years was 8.94 per 1,000, the lowest record for any city in the world with a population of over half a million.—Letter to the Editor from J. S. Purdy, M.D., Metropolitan Medical Officer of Health, Sydney, April 20, 1931.

A Study of the Diets of Federal Prisoners*

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THE feeding of prisoners presents a peculiar problem; it is to supply food to a group of men, restricted in their activities, doing more or less work, with practically no opportunity to satisfy acquired food habits except by not eating. There is limited opportunity to purchase food, especially fruit, in some prisons. The difficulties of prison messing are those related to the psychological aspects of living. They are the problems of feeding men of varied food habits, arising from different standards of living, religious beliefs, and natural or acquired inclinations. With enough food, of the right kind (as public wards, prisoners should receive an adequate diet), the problems are those of sanitation and planning of the meals, preparation of food, and the method of service.

Food is one of the most important factors in a prisoner's life; it is one of the few things which have an element of variety in them. It would seem to be a wise prison policy to permit as great a variability as possible in the choice of foods, the planning of meals and the preparation of food, provided the results are accomplished through the labor of the prisoners on food of healthful quality and without resorting to the use of delicacies. Highly palatable foods like meat, and the food adjuncts, sugar, oleomargarine and jelly, are desirable when they bring about the consumption of staple foods such as bread and potatoes that do not possess flavor to a marked degree.

As a preliminary step in determining the adequacy of the prison diets as they now exist and to have information on which to base a method of rationing, we have obtained and calculated data on the food furnished the main messes at the United States penitentiaries at Atlanta, Fort Leavenworth, Leavenworth, and McNeil Island, and at the reformatory at Chillicothe, O. The quantities of the various

* Read before the Food, Drugs and Nutrition Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 29, 1930.

TABLE I

NUTRITIVE VALUES AND COSTS OF THE AVERAGE FOOD CONSUMED PER MAN PER DAY DURING VARIOUS MONTHS OR QUARTERS IN CERTAIN FEDERAL PRISONS

	Weight lb.	Cost	Calo- ries	Pro- tein grams	Fat grams	Carbo- hydrate grams	Cal- cium grams	Phos- phorus grams	Iron grams
<i>Atlanta</i>									
January	4.06	\$.290	4,006	130	124	598	.602	1.62	.025
May	4.21	.286	4,031	124	118	589	.553	1.54	.029
<i>Chillicothe</i>									
2d Quarter	4.64	.375	4,741	159	172	625	.765	1.82	.028
3d Quarter	4.92	.400	4,807	154	173	647	.788	1.84	.030
4th Quarter	4.88	.405	4,907	159	152	700	.575	1.60	.030
1st Quarter	5.26	.405	5,348	185	144	830	.846	1.99	.036
January	4.88	.400	5,025	120	162	758	.641	1.50	.035
March	5.55	.417	5,259	208	131	837	.633	1.98	.036
<i>Fort Leavenworth</i>									
January	4.93	.352	4,197	153	151	552	1.10	1.89	.029
June	4.77	.331	4,942	136	209	625	.948	1.69	.026
July		.202	3,616	106			.519	1.41	.023
August			4,056	112			.530	1.46	.019
<i>Leavenworth</i>									
January	5.33	.355	5,005	162	182	702	.903	1.86	.029
June	4.77	.332	4,796	147	186	634	.966	1.87	.026
July	5.02	.303	4,869	147	187	648	.999	1.78	.036
<i>McNeil Island</i>									
January	5.06	.287	4,171	137	129	613	.868	1.55	.025
June	5.05	.311	4,288	130	145	478	1.093	1.79	.030

foods used were grouped according to the classification of Miss Hawley.¹ Calculations were also made of the caloric value, protein, fat, carbohydrate, calcium, phosphorus, and iron.

Typical data are contained in Tables I to III. In Table I data are presented for a winter and spring month, and in the case of Chillicothe for the four quarters of the calendar year. The results represent the food supplied, exclusive of ordinary waste resulting in preparation but not corrected for edible food not eaten. In well managed prisons the waste of edible food is about 0.1 lb. per man per day, in others it may be as high as 1 lb. per man per day. The figures given for cost of food represent what is usually designated as gross cost, i.e., the actual money spent for food plus the assigned values for products produced on the farm, especially milk, vegetables and pork. In Table II both gross and net cost are given; the net cost is the actual money expended.

Considered from an abstract nutritional point of view the prisoners received, in general, adequate amounts of protein, fat, carbohydrate, calcium, phosphorus, and iron. The figures given represent the average of the prisons. Some men eat less, some more. Men who work on night shifts usually obtain extra food, all of which is included in the figures given. A record of the number of men not eating meals shows that in some prisons as many as 500 men will miss a meal during the day.

Vitamins seem to be present in moderate amounts. In certain cases the calcium content tends to be low, and in most cases the quantity of phosphorus is about twice that of calcium. For certain domestic animals and the rat such a proportion is not particularly desirable. We do not know the best ratio of calcium to phosphorus for

TABLE II

COSTS AND AVERAGE WEIGHT OF DIFFERENT TYPES OF FOOD CONSUMED, AS POUNDS PER MAN PER DAY, IN CERTAIN FEDERAL PRISONS IN A PERIOD OF SIX MONTHS

	Cost— January to June 1930	1-2*	3	4	5	6	7	9	10	X
<i>Atlanta</i>										
Gross	\$.271	.504	.997	.264	.450	.609	.257	.091	.832	.142
Net	.233									
<i>Fort Leavenworth</i>										
Gross	.346	.343	1.014	.257	.630	.849	.990	.069	.738	.279
Net	.328									
<i>Leavenworth</i>										
Gross	.355	.360	1.128	.320	.609	.957	.757	.107	.827	.256
Net	.329									
<i>McNeil Island</i>										
Gross	.283	.663	1.065	.089	.462	.786	1.089	.091	.500	.189
Net	.211									
<i>Chillicothe</i>										
2d Quarter	.375	.340	1.043	.292	.522	.943	.463	.201	.840	.171
3d " "	.400	.506	1.115	.472	.645	.887	.424	.050	.819	.142
4th " "	.405	.558	1.183	.385	.643	1.015	.132	.052	.915	.192
1st " "	.405	.293	1.583	.337	.678	.980	.215	.067	1.125	.269

- * Group 1. Better sources of Ca than of protein, P, or Fe.
 2. All nutrients of about the same relative importance.
 3. Iron more important than other three nutrients.
 4. Calcium relatively low and other three nutrients high.
 5. Practically lacking in all four nutrients.
 6. Calcium low, protein high, P and Fe intermediate.
 7. Calcium relatively high, Fe low, protein and P intermediate.
 8. Protein and P relatively high and Ca and Fe low.
 9. Calcium relatively low, protein high, P and Fe intermediate.
 10. Protein relatively higher than the other three nutrients.
 X. Condiments.

Fruits, roots and leafy vegetables.
 Dried seeds.
 Sugars and fats.
 Meats.
 Milk and its products.
 Miscellaneous.
 Whole grains or similar products.
 Flour and similar products.

man. In milk calcium and phosphorus are present in approximately equal proportions. Assuming the proportion in milk to represent that desirable for the adult, there would seem to be a need for the addition of calcium to the prison diets to adjust to this ratio. A correction is not to be accomplished with milk, since it adds phosphorus at the same time; the correction appears to be through an increase of vegetables, the addition of calcium as a salt, or the reduction of meat and grains.

Meat plays an important part in the dietary of a prison because of its flavor and general appeal through which it helps to increase the consumption of the bland foods. The grains are a cheap source of energy yielding food. It would seem, therefore, to be advisable to increase the consumption of calcium through the use of vegetables and also the addition of calcium salts to the ration. The increased consumption of vegetables is at times a problem in itself. The men do not always eat them, due partly to dislike and partly to the method of preparation. An increased consumption is to be attained through skilled cooking or through combination with other foods as in stews or meat loaves.

TABLE III

COSTS AND AVERAGE WEIGHTS OF SELECTED FOODS CONSUMED, AS POUNDS PER MAN PER DAY, IN CERTAIN FEDERAL PRISONS OVER A PERIOD OF SIX MONTHS

	Cost Gross	Beets	Carrots	Onions	Tomatoes	Cabbage	String beans	Spinach	Potatoes	Beans Dried	Eggs	Olco	Sugar	Beef	Milk	Evap. to Fresh	Flour	Macaroni
		lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.	lbs.		lbs.	lbs.
<i>Atlanta</i>	\$.271	.028	.031	.192	.051	.111	.058	.013	.565	.131	.062	.069	.158	.341	.259	$\frac{1}{1.9}$	.793	.028
<i>Fort Leavenworth</i>	.346	.011	.028	.104	.048	.076	.047	.069	.763	.082	.096	.074	.338	.571	1.050	$\frac{1}{4.6}$	.686	.021
<i>Leavenworth</i>	.355	.004	.033	.098	.111	.072	.094	.072	.818	.052	.079	.084	.319	.444	.806	$\frac{1}{4}$	.769	.022
<i>McNeil Island</i>	.283	.041	.062	.126	.040	.041	.026	.047	.735	.033	.046	.034	.258	.521	1.069	$\frac{1}{480}$	.403	.009
<i>Chillicothe</i>																		
2d Quarter	.375	.029	—	.099	.006	.247	.044	.064	.645	.076	.116	.074	.281	.452	.588	$\frac{1}{1.2}$	.792	.031
3d Quarter	.400	.091	.020	.132	.010	.215	.050	.011	.740	.145	.091	.083	.378	.554	.564	$\frac{1}{0.8}$	.771	.019
4th Quarter	.405	.018	.032	.014	.126	.170	.139	.015	.762	.111	.095	.034	.449	.513	.238	$\frac{1}{0}$	.828	.036
1st Quarter	.405	.050	—	.092	.033	.083	.050	.032	1.297	.170	.049	.039	.467	.622	.341	$\frac{1}{0.3}$	1.001	.038

It is evident from a consideration of the data that the food consumption is high in certain prisons; a matter that is being adjusted at present. The condition in the Atlanta prison is an interesting one. For several years daily calculations of protein, fat, carbohydrate, and energy have been made and the daily ration adjusted to a standard. The present cook takes a great deal of interest in the results that are supplied to him by the storekeeper—the originator, we believe, of the plan. The results obtained are satisfactory with regard to the factors considered; there is a need for more vegetables and milk. The warden is developing his dairy herd to obtain more milk, and plans have been made to raise and can or store vegetables. This plan is present in all of the penitentiaries.

It is proposed to produce as many vegetables as possible on the farm of each prison and to can and redistribute material that can be grown at one prison to better advantage than at another. The condition at McNeil Island also appears to be satisfactory. This prison is in the fruit and vegetable country of the Northwest where vegetables and fruits can be grown or obtained cheaply. At the other prisons the cooking is generally good considering the facilities. The problems of adjusting the ration to a more economical basis are those of preparation, service, and possibly waste.

With the data on Leavenworth are included results for July and August, 1929. In August there was a food riot. These months were immediately following a period of enforced stringency in funds which necessitated a reduction of expenditures for food. Unfortunately this reduction was continued into the next fiscal year. There was apparently sufficient food; the difficulty lay as much in the planning of the meals as in any other factor—the meals of one week were just like those of the next. There was a difference in method of service at Leavenworth between January and June and July. A cafeteria service was in effect in the latter months, but it has not had a marked effect on food consumption or wastage. The data in Tables II and III indicate the distribution of the quantities of the various foods in the prisons, based on a 6 months' average. These figures permit a study of the variation in food habits and of cost.

The present method of rationing has been to set an arbitrary figure from year to year for the cost per man per day—based on the expenses of the past year and probable cost of food in the coming year. It is our intention to evolve a basis for rationing on the food required for a reasonably satisfactory mess under prison conditions.

Taken as a whole the prisoners in the federal prisons receive an adequate amount of food; corrections are desirable in relation to cal-

cium and in some cases in the amount of food eaten. The success of a prison mess rests, therefore, first on the steward, with his ability to plan and prepare palatable meals, to estimate the amount of food the men will eat, and to see that it is properly served; and second with the discipline of the prison which assures an even and adequate service and helps to reduce waste.

REFERENCE

1. Hawley, Edith. A Short Method of Calculating Energy, Protein, Calcium, Phosphorus, and Iron in the Diet, U. S. Department of Agriculture *Technical Bulletin No. 105*, Jan., 1929.

Turkey Child Welfare Provisions

THE general public health law of Turkey, which became effective November, 1930, and which is apparently the first of its kind in that country, contains a chapter on child health, and authorizes the Ministry of Health and Social Welfare to "take all measures" necessary for the promotion of child hygiene. Some of the measures prescribed in this chapter are:

1. Establishment of child health centers in cities with a population of over 10,000
2. Periodic physical examinations and mental tests of school children
3. Courses in child hygiene for girls in secondary schools
4. Supervision over boarded out children less than 7 years old
5. Protection by the State of children mistreated by their parents or guardians
6. Pecuniary aid to mothers having at least 6 living children

The chapter on industrial hygiene prohibits the employment of children less than 12 years old, night work for persons less than 16 years old, and the employment of expectant mothers on harmful work for 3 months before confinement; employment on ordinary work is prohibited for 3 weeks before and 3 weeks after confinement; persons less than 16 years old may not work more than 8 hours a day.

The law provides for the enactment of a Labor Code which will contain additional measures for the protection of workers.—Office International d'Hygiène Publique, *Bulletin Mensuel*, Paris, Apr., 1931, p. 598.

Rôle of the Pay-Cost Clinic*

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MOUTH hygiene activities were started in Cleveland, as in most places, purely as a charity. The object was to provide free dental service for poor children. The idea appealed and still appeals to the philanthropic instincts of members of the dental profession.

Charity is most commendable, but it rarely solves a social problem. Giving people a chance to provide for themselves is much more likely to solve the problems of society.

Cleveland was one of the early participants in the movement to provide free dental service for children. It was more than 30 years ago that the idea assumed material form. Large groups of school children were examined and 97 per cent were found to have diseased teeth. Then came a wave of installing dental outfits in schools and institutions for relief, repair and restoration of children's teeth. This service reached only a very few, of course, but elicited much favorable comment from teachers and others concerned.

Then came a period of publicity and propaganda exalting the value of tooth brushes, tooth pastes, and dental care for children. It was based on the conspicuous improvement in mental agility—not ability—in conduct, interest, and health of the children which so frequently follows the removal of septic mouth conditions. Elaborate programs of tooth brushing, etc., were developed here and there and reports were soon forthcoming of marked improvement in the children under care, treatment, and observation.

When the charitable instincts of the dental profession had been drawn upon to the limit, efforts were made, often successfully, to place the responsibility for the dental service upon school boards and health departments. This accomplished, the activity became one of public health rather than a charity, which always involves an entirely different viewpoint and mode of attack. It was observed that the cost was 5 times as much to care for 13-year old pupils as for those 6-years old. Therefore, a given sum could care for 5 pupils at the age of 6 and pre-

* Read at a Joint Session of the Child Hygiene and Food, Drugs and Nutrition Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

vent their becoming the 13-year old problems. This idea of service for 6-year olds was established in the Cleveland schools nearly a decade ago. With the money available, it was possible to care for about 26 per cent of the 6- and 7-year old pupils in first grade. It was hoped and expected that parents would see that the care of children's teeth was continued after they were once put into good dental condition.

Some years of experience established the fact that little was being done for the children in the school clinics except those of 6 or 7 years. So large a turn-over is experienced from first to sixth grade that those cared for as first graders are almost entirely lost sight of when we come to examine the sixth grade before sending them into Junior High School. Realizing that it was not practical to secure board of education or health department support sufficient to provide care for teeth of all pupils in all the schools, some other program had to be developed. An analysis of the problem made clear that we had some 78.9 per cent of public school elementary pupils needing attention while 18 years earlier, 97 per cent needed attention. The difference was wholly in the number of cases that had received complete dental care and that almost entirely at the hands of our school dentists. In other words, we had met, through all agencies, only about 20 per cent of the problem.

During the past decade, we have preached milk, fresh fruits, green leaves, and vegetables. While here and there we think we see improved conditions as the result of diet, the extent of improvement among the city's child population is not encouraging. Experimentally, one can get results with proper diet, air, light, rest, exercise and water. Why do we not secure the same results when applied to a community?

Comish in *Standards of Living* throws some light on the matter of income and living standards of the wage earning population of the United States. He shows that 16.7 per cent of families live on a poverty standard or \$1,000 per annum or less; 34.84 per cent live on a minimum subsistence, or \$1,600 per annum or less. In other words, 50 per cent are financially embarrassed all the time. He shows that 44.64 per cent have from \$1,800 to \$4,800 per year per family. These, he says, live on a health and comfort standard, but how many of you think a family of 5 can live in comfort on \$1,800 a year? There remains a group, 3.82 per cent, who live on \$5,000 and up per family. These, Comish says, live in luxury.

It has long been realized that some 20 per cent of the people employ dentists for other than relief of pain. It is generally accepted that approximately 10 per cent are too poor to pay anything for medical and dental service. This leaves 70 per cent who need and want

dental service but are probably not able to pay the usual professional fees. Efforts have been made to refer children to private dentists. It is possible to send about 50 per cent to the dentist, that is, 50 per cent of the parents will say they will take the children to the dentist, but upon checking up we find that but 40 per cent have had service and 60 per cent have not. Analysis indicates that the fundamental reason for the failure to secure dental services for children is economic. There are no surplus funds for such expenses. In other words, the same 20 per cent that have been patronizing dentists will provide dental care for their children and the rest go without. We then have 70 per cent who need, but cannot afford private dental service and should not be given free service. How are these children to be cared for?

There are two urgent problems confronting us: those having badly diseased teeth which require extraction, involving about 40 per cent of the children, and another group of 78 per cent who need fillings or fillings and extractions. The most urgent need seems to be for the removal of septic teeth, since these are an immediate menace to the child's health and happiness.

After much discussion, it became possible in Cleveland to have established 3 extraction surgeries for children on a "Pay-Cost" basis. "Pay-Cost" is a term coined to mean the entire cost of overhead, depreciation and interest on investment, supplies, maintenance and personnel, that is, all the cost of service under organization and system.

It has been found possible to extract teeth for children in these institutions for \$1.75 per case—not per tooth. The average case requires the extraction of about 3.7 teeth. This fee, \$1.75, includes the nitrous oxide anesthesia and the after care. Such service requires for a clinic session of 3 hours, the following staff:

1 Director	Dentist	2 Surgery Nurses
1 Extractor	"	1 Surgery Orderly
1 Anesthetist		1 Recovery Room Nurse
1 Supervisor (relief anesthetist)		1 Sterilizing Room Assistant
1 Admitting Clerk		1 Janitress
1 Preparation Nurse		1 Janitor

All the staff are paid reasonable compensation. They are usually on duty about 4 hours for a 3-hour clinic.

It should be realized that this type of clinic is for service only, not for teaching in connection with a school of dentistry or medicine. Strict asepsis must be and is observed. Thorough organization and attention to details are necessary to effect the economies that make possible a pay-cost service for extraction at \$1.75 per case. The nor-

mal capacity of these clinics is 60 per morning; however, the number often reaches 70 and 80.

Cleveland has 166,000 pupils, in kindergarten to ninth grades inclusive, under organized care. Since 40 per cent of these need extractions, we have 66,400 pupils to care for. As shown above, we may hope for 20 per cent or 13,000 to be cared for by private dentists and 10 per cent or 7,000 in free clinics. This leaves 46,000 to be cared for in pay-cost clinics.

The 3 institutions can care for about 7,200 each, or, collectively, 21,000 or 22,000. In 1929, the 1 such clinic then established cared for 7,290 cases. The 3 now in operation can meet the needs fairly well; that is, they can care for one-half those needing service, which probably is all the school staff can handle. The next step is to provide pay-cost filling service for the great 70 per cent of children so as to save the teeth.

What relation has all this to national problems and nutrition?

We have described a method that has worked in one city and can easily be applied in any other. It is successful because it brings the cost of service within the means of the great mass of self respecting people of meager earning ability. It brings opposition from many sources, of course, but whatever one does provokes adverse comment. The relation to nutrition is just this. We have taught the newer knowledge of nutrition but find meager results. Why? Because it costs money to have fresh, clean air to breathe. It costs money to have exercise and rest under a health promoting environment, and 70 per cent of the people have not enough money to buy all these desirable factors for the promotion of health, including sound teeth.

The immediate problems confronting us are teeth decayed and aching. The needs of today must be cared for while we continue to teach ideas that will make for improvement tomorrow.

The "Pay-Cost Clinic" is the most helpful agency yet employed.

Comparative Dietary Studies of American Children of Nursery School Age*

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THE preschool child has, in late years, received perhaps more than his share of attention. While much of this has been directed toward a study of problems relating to nutrition, very little of it has been devoted to the collection and interpretation of statistical material on food intake. Such investigations are called dietary studies and form, in the main, the basis for our present dietary standards.

In recent years, dietary findings in regard to protein and minerals have been considerably supplemented by balance experiments in which attempts have been made to find the intake of these substances that will bring about the best retention in the body. Also, calorimeter experiments have reinforced the material relating to calories. At best, however, the data upon which our dietary standards for children are based are none too large in amount or too convincing in nature. Nevertheless, these standards, even though unsatisfactory, provide us with criterions for judging the physiological efficiency of a diet, either of an individual child or of a group. Moreover, comparison of the adequacy of the diets of different groups may be made on the basis of the amount and kind of variation from established standards.

It was primarily with the idea of obtaining data on which a comparison of the adequacy of the diet of Mexican, Negro and American children of preschool age might be based that the present investigation was undertaken. In addition, by using figures obtained from children of normal weight only, averages have been secured that may be compared with standards already in existence. Lastly, an attempt has been made to relate the dietary findings to the physical condition of the various groups studied.

The material on which this study is based consists of records of food intake, covering a period of 1 week, for 50 Negro, 50 American

* Read at a Joint Session of the Food, Drugs and Nutrition, and Child Hygiene Sections of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

and 75 Mexican children. The Negro and American studies were made in Austin, Tex., while the Mexican material was obtained partly from Austin and partly from San Antonio. Careful supervision over the records was exercised in order to obtain as great a degree of accuracy as possible. The calorie, protein, calcium, phosphorus and iron content of the daily diet was computed for each of the 7 days and the average per day for each child obtained. Averages were also calculated for each age and sex group of the various nationalities, and comparisons made on the basis of (1) differences in these averages, (2) the variation of the average from the standard, and (3) the percentage of individual diets below the standards in each of the groups. Vitamin content of the diet of the different groups was judged on the basis of the amount of food, rich in the various vitamins, contained in the diets.

TABLE I

AVERAGE DAILY PROTEIN INTAKE IN GRAMS PER KILOGRAM OF BODY WEIGHT OF MEXICAN, NEGRO AND AMERICAN CHILDREN OF PRESCHOOL AGE

<i>Boys</i>	<i>American</i>	<i>Negro</i>	<i>Mexican</i>
2-3 yrs.	3.24	2.89	2.60
3-4 yrs.	2.46	2.70	2.40
4-5 yrs.	2.19	2.53	2.18
Average	2.63	2.37	2.39
<i>Girls</i>			
2-3 yrs.	2.53	2.76	2.70
3-4 yrs.	2.31	2.45	2.62
4-5 yrs.	2.25	2.15	1.89
Average	2.36	2.45	2.40

The groups were fairly evenly divided as to sex, but the different ages were unevenly distributed, and in no case was the age group large enough for the average figures to be more than indicative.

Table I gives comparative results for the protein intake. The average amount of protein consumed daily by preschool children of the 3 nationalities studied was between 2 and 3 gm. per kg. of body weight. This is the amount advocated as desirable by many investigators. There was no great difference in the averages for the nationality groups, but in every case the younger children received a larger amount of protein per unit of body weight than the older ones, and the boys more than the girls.

In spite of the fact that average consumption figures are within the standard, a study of the individual dietaries showed that less than 2 gm. of protein per kg. of body weight was taken by 20 per cent of

the American children, 26 per cent of the Negro children, and 18 per cent of the Mexican children. There was apparently no great difference in the percentage of children suffering from protein deficiency in the 3 nationality groups. Similar figures for age and sex groups showed that a larger proportion of the older groups than of the younger and of the girls than the boys received insufficient protein. This tendency was especially marked among the Mexicans.

TABLE II

AVERAGE DAILY CALORIE INTAKE PER KILOGRAM OF BODY WEIGHT OF MEXICAN, NEGRO AND AMERICAN CHILDREN OF PRESCHOOL AGE

<i>Boys</i>	<i>American</i>	<i>Negro</i>	<i>Mexican</i>
2-3 yrs.	91.80	83.30	78.32
3-4 yrs.	74.19	82.36	73.40
4-5 yrs.	66.80	74.85	61.70
Average	77.60	80.16	71.14
<i>Girls</i>			
2-3 yrs.	78.06	79.54	74.42
3-4 yrs.	74.05	72.46	74.75
4-5 yrs.	65.52	65.48	51.12
Average	72.54	72.49	66.75

Comparative data on calorie intake are given in Table II. Here considerable variation in the nationality groups, as well as in the age and sex divisions within these groups, was shown. The Mexican children had a lower calorie intake than either the Negro or American. Girls, in all cases, had a lower intake than boys. As would be expected, there was a decrease in the calorie intake per unit of weight with age.

The averages were from 12 to 25 per cent below the Holt standards, which were selected for use here because they are stated on the basis of weight, thus giving more definite criterions from which to reckon deviations than those on an age basis. These standards are per kg. of body weight: for 2-3 years, 92.4 calories; for 3-4 years, 88.4 calories; and for 4-5 years, 85.6 calories.

In an effort to avoid overemphasis of calorie deficiency, it was decided to consider as inadequate only diets that were more than 10 per cent below Holt's standards. On this basis, calorie inadequacy was present in 52 per cent of the American, 62 per cent of the Negro, and 66 per cent of the Mexican dietaries. It was also found that only in the Mexican group was the percentage of calorie deficiency larger for the older than the younger children, but that in every group this deficiency was more marked among girls than boys.

Of the minerals necessary for the building and regulating functions of the body, only calcium, phosphorus, and iron are usually considered in a dietary study since it is thought improbable that a diet furnishing a sufficient supply of these elements, which are necessary in large amounts, will not also provide enough of the minerals which the body needs in only small quantities. Table III gives the average daily intake in grams for calcium, phosphorus and iron.

A study of these averages showed that the Negro and Mexican intake of calcium was not much more than half that of the American. This large difference was not apparent in either phosphorus or iron,

TABLE III

AVERAGE DAILY MINERAL INTAKE IN GRAMS OF MEXICAN, NEGRO AND AMERICAN CHILDREN OF PRESCHOOL AGE

<i>Calcium</i>			
<i>Boys</i>	<i>American</i>	<i>Negro</i>	<i>Mexican</i>
2-3 yrs.	.9756	.6021	.6224
3-4 yrs.	.9269	.5678	.6103
4-5 yrs.	.8492	.5760	.4868
Average	.9172	.5819	.5731
<i>Girls</i>			
2-3 yrs.	.7968	.6422	.5199
3-4 yrs.	.6721	.5893	.5280
4-5 yrs.	.8534	.4657	.5095
Average	.7741	.5657	.5191
<i>Phosphorus</i>			
<i>Boys</i>			
2-3 yrs.	.9912	.8030	.9489
3-4 yrs.	.9522	.8344	.8407
4-5 yrs.	.9871	.7719	.8509
Average	.9768	.8031	.8801
<i>Girls</i>			
2-3 yrs.	.7804	.7547	.9913
3-4 yrs.	.7560	.7214	.9531
4-5 yrs.	.9101	.6808	.7560
Average	.8155	.7189	.9001
<i>Iron</i>			
<i>Boys</i>			
2-3 yrs.	.00711	.00700	.00512
3-4 yrs.	.00598	.00712	.00615
4-5 yrs.	.00797	.00706	.00538
Average	.00702	.00706	.00555
<i>Girls</i>			
2-3 yrs.	.00575	.00725	.00480
3-4 yrs.	.00588	.00677	.00489
4-5 yrs.	.00676	.00585	.00434
Average	.00613	.00662	.00468

the phosphorus intake of the American group being only slightly higher than either the Negro or Mexican, and iron intake slightly lower than that of the Negro, but considerably higher than that of the Mexican. In all 3 groups, the average intake of girls, for each of the minerals, was considerably lower than that for boys. There was a general tendency for the calcium and phosphorus intake to be highest for the youngest group. This propensity was not found in iron.

According to Sherman¹ and other investigators, the large demands of the growing child for calcium and phosphorus make necessary an intake of at least 1 gm. per day of each of these minerals. No such definite statement as to iron requirement is available, but Rose² suggests that a child needs at least as much iron per unit of calorie requirement as an adult, i.e., 0.0005 gm. of iron for every 100 calories. On the basis of the above mineral standards, and considering as inadequate only diets that were more than 10 per cent below the standard, it was found that calcium inadequacy existed in 50 per cent of the American, 90 per cent of the Negro, and 96 per cent of the Mexican dietaries; phosphorus in 38 per cent of the American, 74 per cent of the Negro, and 64 per cent of the Mexican dietaries; and iron in 50 per cent of the American, 32 per cent of the Negro, and 66 per cent of the Mexican dietaries.

In a general way it may be said that the percentage of diets deficient in calcium and phosphorus was almost twice as great for Negroes and Mexicans as for Americans, but the larger percentage of calcium inadequacy in the American diets makes the calcium deficiency of the Negro and Mexican diets much more outstanding than that of phosphorus. Negro children were apparently much less likely to suffer from iron deficiency than either American or Mexican, the latter faring worst of all in this respect.

The percentage of calcium inadequacy was found to be fairly evenly distributed through the various age groups in American and Negro diets, but to be much greater among the older than the younger Mexican children. The distribution of iron and phosphorus deficiency seemed to be fairly even in the various ages for all 3 groups. Again, in all groups a larger percentage of girls than boys suffered from deficiency in all 3 of the minerals.

In the American group the mineral deficiencies were mostly the result of calorie deficiency; i.e., there were very few cases of adequate calories accompanied by inadequate minerals. In the other groups, however, adequate calorie intakes were found along with inadequate calcium or phosphorus or both. The difference in the calcium content of the diets of the 3 groups is to be explained almost entirely on

the basis of the difference in the amount of milk used. The average amount of milk taken by the American children was slightly more than $2\frac{1}{2}$ cups per day, while for both the Negro and Mexican groups it was somewhat less than $1\frac{1}{2}$ cups. The low figures for iron inadequacy in the Negro group are probably explained by the wide use of "greens." Greens appeared on only 3 of the Mexican diets.

Taking into consideration the 5 food factors discussed, protein for every group was the one least likely to be deficient. While calcium was outstandingly deficient in Negro and Mexican diets, American diets were no more likely to be inadequate in this than in calories or iron. Calculation of the average number of deficient factors for each group shows this to be 1.8 per child for the American, 2.6 for the Negro and 3.4 for the Mexican.

In order to obtain figures that might be compared with existing standards, the average intake for each of the 5 food factors for children of normal weight only was calculated. The results showed, briefly, that the averages for protein and iron were within the standards, but that the average calorie intake was from 10 to 15 per cent below, the average calcium intake approximately 33 per cent below, and the average phosphorus intake almost 20 per cent below standards. The maintenance of weight does not, of course, mean the maintenance of health.

An attempt will be made to discuss and compare the vitamin content of the diets on the basis of the amounts of vitamin-rich foods contained therein.

For vitamin A, milk, butter, egg yolk and leafy vegetables are depended upon. In none of the diets was there enough milk to furnish, unsupplemented, a sufficient amount of this vitamin, but the Mexican and Negro diets required much larger supplements than the American. Butter, however, was used in larger quantities in the American than in either of the other groups. A study of the diet of Mexican families showed that a low income group used only $\frac{1}{4}$ lb. per week per family, and a higher income group only $\frac{1}{2}$ lb. Eggs were used in about equal amounts by Negro and American children, but much less than once a day, which is the prescribed amount. They are evidently widely used by the Mexicans, as the study referred to above showed from 2 to 3 eggs per family daily.

The "greens" used by the Negroes helped to supplement their diet in regard to this vitamin, a supplement lacking in the Mexican diets. Fifty per cent of American children had been given cod liver oil with more or less regularity, thus enriching their diet immeasurably in vitamin A. Cod liver oil therapy was practically unknown among both

the other groups. On the whole, it seemed that the diet of American children ranked first in regard to A, that of Negroes next, and Mexicans last.

It is thought that none of the groups were so apt to suffer from B as from A deficiency, but that a wider variety of fruits and vegetables and the use of larger amounts of milk and whole grain rather than milled cereals gave the American diets a better content of B than either the Negro or Mexican. The Mexicans use large amounts of cereal, but to a great extent they have substituted white flour for whole corn products which in the past were so extensively depended upon. This practice is undoubtedly cutting down their B supply. Neither Mexicans nor Negroes used whole wheat to any appreciable extent. Not one of 144 Mexican families included in a dietary study bought whole wheat flour or bread during the week which the study covered. Whole wheat bread appeared on only 2 of the diets for Negro children, but was used almost exclusively in the American diets. To offset a possible B deficiency, there was the wide use of beans, potatoes and tomatoes, all good sources of this vitamin, by both Mexicans and Negroes.

Fresh fruits and raw vegetables are splendid sources of Vitamin C. These appeared with much more regularity in the American than the other diets. However, spinach, cabbage, and tomatoes were present with considerable frequency in the Negro diets and potatoes were a staple. Potatoes and tomatoes were also widely used by Mexicans as were onions, another good source of C. In spite of the restricted nature of the Negro and Mexican diets, it is thought that they contained fair amounts of C, and that there was less danger of a lack of this vitamin than of either A or B.

Unless obtained by special therapy, the supply of vitamin D depends largely upon sunshine. Whether there is any difference in the amount of sunshine to which the children in the various groups are exposed is not known. It is possible that Negro and Mexican children are in the sunshine for longer periods than American children, and that, because of less clothing, the ultra-violet rays have better access to their bodies. However, greater pigmentation of the skin might be expected to offset this advantage. Since special therapy was employed to provide a large proportion of American children with this vitamin, i.e., cod liver oil or viosterol, they were probably better supplied than children of the other groups.

So little is known about the food content of G that no effort will be made to compare the diets in regard to this vitamin.

Summarizing briefly, it may be said that the group of American

preschool children, although far from being supplied with adequate amounts of the necessary food elements, were less inadequately nourished than the children comprising the Negro and Mexican groups, and that Negro diets were somewhat more adequate than Mexican. There was a fairly definite tendency, especially marked in the Mexican group, for the younger children to be better fed than the older, and a decided tendency for boys to be better fed than girls. The most outstanding inadequacies were those of calcium and vitamin A in the Negro and Mexican diets. These are probably to be accounted for on the basis of the small amount of milk used. A considerable number of the children were maintaining weight on diets that were appreciably below standard in one or more factors.

Environment and diet are so interrelated in their effect upon the physical condition of the child that caution must be used in attempting to separate them as causative factors. It is felt, however, that this study would be incomplete without some attempt to point out probable relationships, or the lack of them, between the calculated dietary deficiencies and the physical conditions existing in the groups studied.

Weight for height and age, though far from a perfect index, is often considered the best single criterion of a child's health, and calorie intake is thought to be more directly related to the maintenance of normal weight than intake in any other factor. From the data on calories already given, a large percentage of underweight in each of the groups might be expected. Using the Woodbury standards and considering more than 7 per cent below normal as underweight, it was found that 96 per cent of the Mexican, 94 per cent of the American and 66 per cent of the Negro children were maintaining normal weight. Not knowing how to explain this disconcerting result it was decided to obtain underweight statistics on larger groups of children, in order to see if the above percentages were representative. Data on 80 American preschool children that had been admitted to the nursery school connected with the university in Austin showed 17 per cent of them to be underweight, and the physical examination records of 200 Mexican preschool children in San Antonio showed 32 per cent of underweight. No data on a larger Negro group were available.

In view of the effect of mineral deficiencies on the growth of the skeleton, it was thought interesting to compare the percentages below, within and above normal height for age in the 3 groups. This was done by using the Merrill-Palmer figures which give a normal range of height for age. In the Mexican group 86 per cent of the children were below this range, 14 per cent within, and none above; in the Negro group 27 per cent were below, 46 per cent within, and 27 per cent

above; in the American group 17 per cent were below, 43 per cent within, and 40 per cent above. Many other factors than diet, notably heredity, are important in determining height, but it is not impossible that mineral deficiencies were to some extent responsible for the above differences.

Since calcium deficiency was so outstanding in the Negro and Mexican diets, it was obviously logical to look for physical results of this inadequacy. However, present-day literature on the subject does not make very clear what results are to be expected from low calcium intake, unaccompanied by vitamin D deficiency. Calcium, vitamin D, and vitamin C are all said to be necessary for the production of good teeth. No data on teeth are available for a large group of Texas-American children, but a survey of Kansas preschool children was made by Rypins,⁵ who reported that of 1,197 children, 27.2 per cent had dental caries which averaged over 1 decayed tooth for each mouth examined, and almost 4 decayed teeth for each of the carious mouths, and that of the teeth erupted, 6.3 per cent were carious. Comparable figures for 200 Mexican children show that 41 per cent of the children had decayed teeth with an average of 1.2 decayed teeth for each mouth examined and 3 decayed teeth for each of the carious mouths. Of the teeth erupted, approximately 7 per cent were carious. If comparison between these 2 groups is valid it shows a larger percentage of bad teeth in the Mexican group. No data on a group of preschool Negro children are available, but Sterling⁴ in a study made in Atlanta, Ga., of 5,000 Negro children of school age, found that only 35 per cent had carious teeth. He states that this figure compares very favorably with figures for white children.

The extent to which "signs" of rickets appear in the carious groups might be taken as indicative of differences in vitamin D supply. Well developed cases of rickets seldom appear in this climate, but a definite number of children show signs of early rachitic lesions, such as enlarged wrists and ankles, Harrison's groove, depressed ensiform, etc. Physical examinations of 200 Mexican preschool children showed that 19 per cent had rachitic signs other than flat-feet, bow-legs and knock-knees, while only 7 per cent of the 75 children admitted to the University Nursery School showed definite signs of rickets. The percentage of flat-feet, bow-legs and knock-knees was large in both groups, but these abnormalities, in the absence of other signs, are not considered as definitely indicative of rickets. Again no data on a Texas-Negro group are available.

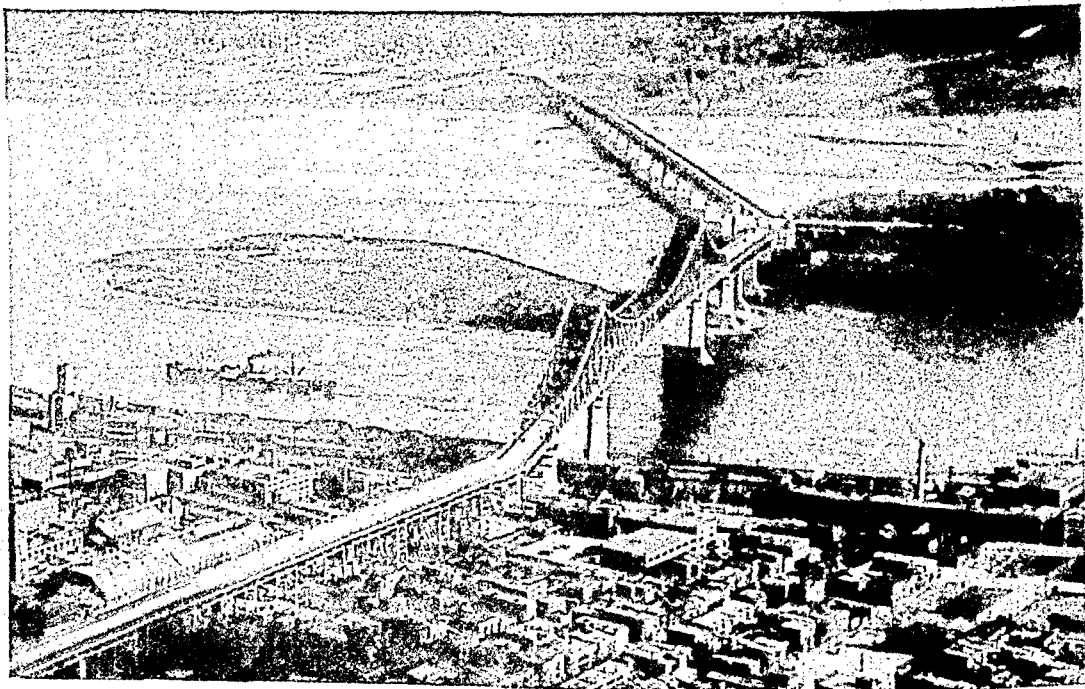
Lastly, marked deficiency in vitamin A was found to be characteristic of Negro and Mexican diets. Slow growth and a lack of re-

sistance to infection have been found to result from a low intake of this vitamin. Lowered resistance to infection is characteristic of Mexicans and Negroes, both children and adults. Fully twice as many Mexicans as Americans die of tuberculosis, and the percentage of Mexican children under 2 years of age that die from diarrhea, presumably caused by infection, is more than 4 times that of American; above 2 years of age it is twice as great. These differences are no doubt partly due to increased exposure to infection, but it is entirely possible that low vitamin A intake, together with other food deficiencies, is largely responsible.

Although the data on physical condition are too inadequate to admit of a striking demonstration of the relationship of diet to physical well-being, it is thought that evidence of such relationship is not entirely lacking.

REFERENCES

1. Sherman. *Chemistry of Food and Nutrition* (3d ed.), 1926, p. 542.
2. Rose. *Laboratory Handbook for Dietetics* (3d ed.), 1929, p. 27.
3. Quoted from McCollum and Simmonds. *Newer Knowledge of Nutrition* (4th ed.), 1929.
4. Sterling. *Pub. Health Rep.*, 43, 42.



NEW MONTREAL HARBOR BRIDGE OVER ST. LAWRENCE RIVER SHIP CHANNEL

Effect of Diphtheria Immunization upon Case Incidence and Mortality*

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THE control of diphtheria in Kansas is a problem that has to do with 1,852,114 individuals who are irregularly distributed over an area of 81,774 square miles. Thirty-three per cent of the population is urban and 67 per cent rural. The population in age groups under 20 is as follows:

TABLE I

Under 1 year.....	30,684
1-4 years.....	154,950
5-9 years.....	185,047
10-14 years.....	180,557
15-19 years.....	170,840
Total.....	722,078

For 1920, before any immunization work was started, 84 per cent of the reported cases of diphtheria occurred in the age group below 20, and 16 per cent above. The percentages under 20 are shown in Table II.

TABLE II

Under 5 years.....	17.0 per cent
5-9 years.....	37.7 per cent
10-14 years.....	21.2 per cent
15-19 years.....	8.1 per cent
Total.....	84.0 per cent

In 1921, Kansas had the most severe epidemic of diphtheria in its history; 7,849 cases were reported with 382 deaths.

The first toxin-antitoxin administered on a county-wide basis was in Wabaunsee County with a rural population of 10,710. The largest village is Alma, the county seat, with a population of 771. Diphtheria being epidemic in this county, the county commissioners, who are the county board of health, agreed to furnish the toxin-antitoxin to each

* Read before the Epidemiology Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 29, 1930.

Health, June 30, 1930, in "The Diphtheria Campaign to Date," we note the cases and deaths for 10 years:

COMPARATIVE CASE FATALITY RATE FOR NEW YORK CITY AND STATE OF KANSAS

	New York	Kansas
1920	5.9 per cent	4.9 per cent
1927	5.3 " "	6.9 " "
1929	5.4 " "	7.3 " "

For New York City, the case fatality rate has shown a decrease while in Kansas the rate has gradually increased. We have observed in Kansas that diphtheria is apparently of a more virulent type as the number of immunized children is increased. Health bulletins from other states call attention to the apparent increase in their case fatality rate following the immunization of large numbers of children.

In culturing 20,000 school children over the State of Kansas, it was found that the percentage of carriers was practically the same in immunized groups as in counties where immunization has been neglected. Our observations are that the immunized carriers pass diphtheria organisms of the most virulent type to the non-immunized child with the result that the case fatality rate is increasing each year among non-immunized children who contract diphtheria. Also, the adult population, a percentage of which has not acquired a natural immunity, are contacts with immunized children who are carriers. In 1920, 16 per cent of the reported cases occurred in age groups above 20. For 1929, 73.8 per cent were in the age group under 20 and 26.2 per cent were 20 or more, showing a decrease of 10.2 per cent below, and an increase of 10.2 per cent above 20 as compared to the reported cases in Kansas for 1920, as shown in Table V.

TABLE V

Year	Under 5 years	5 to 9	10 to 14	15 to 19	20 or over
1920.....	17.0	37.7	21.2	8.1	16.0
1929.....	20.6	32.2	13.4	7.6	26.2

These figures show 2.6 per cent increase under 5 years, 5.5 per cent decrease 5 to 9, 7.8 per cent decrease 10 to 14, 0.9 per cent decrease 15 to 19, and 10.2 per cent increase 20 years or more.

At present, 60 per cent of the children from 1 to 14 have received toxin-antitoxin. We believe there are other factors in addition to toxin-antitoxin immunizations which have played an important part in decreasing diphtheria cases and deaths, such as:

1. The physical examination of school children with the increased correction of defects relating to the nose and throat. Many children with defects of this type have been found who remain carriers of virulent diphtheria organisms for many months, medicinal treatment being of no value in clearing the carrier. Only by a surgical correction were these children made negative.

2. In 1922, the diphtheria quarantine period was extended to 16 days, with release at the end of this period only after 2 consecutive negative cultures 48 hours apart, and culture of all other members of the household. This rule has demonstrated that it prevents the release of numerous persistent carriers.

3. The culturing of contacts, especially in the schools, the removal and quarantine of the carrier for the same period as an active case with release under the same conditions.

The detection of a carrier is comparatively simple, but the problem of returning negative nose and throat cultures is much more difficult. If a carrier has diseased tonsils, they should be removed and any other pathological condition of the nose and throat corrected.

We have mentioned the county-wide immunization of the children of Wabaunsee County in 1921. This same plan was again adopted in 1926 for the non-immunized children who had entered school the past few years. After this second immunization work was completed, a careful check showed 95 per cent of the school population immunized. In October, 1929, a representative of the Division of Communicable Diseases checked the schools of the county to discover the percentage of immunized children in the various school districts. Only 52 per cent of the attendance was found to have received the toxin-antitoxin immunization. Every school district having non-immunized children arranged for the free immunization of pupils not having previously received the treatment. The results of this survey stress the importance of a yearly check on the number of pupils immunized, as even in this rural community the population shows a number of changes each year.

The Kansas diphtheria death rate per 100,000 population was in 1920 14.6; 1926, 2.7; 1929, 3.6.

The conclusions from these observations over this 10-year period are:

1. When 50 per cent or more of the children are immunized in a rural community, the non-immunized child is in greater danger of a fatal termination if it contracts diphtheria than in counties where no immunizations have been done.
2. Fatal cases are showing an increase in children under 1 year of age with an increased morbidity rate. The percentage of adult cases reported has shown an increase each year.
3. The treatment of diphtheria has improved during this period because physicians are giving 10,000 or more units of antitoxin. In the past 3,000 and 5,000

units were more often given as the initial dose. Adequate dosage of antitoxin given early will reduce the case fatality rate.

4. Many immunized children in rural districts are carriers of highly virulent diphtheria organisms.

5. Diphtheria shows an increased percentage of reported cases in the age groups above 20.

6. To be successful in the eradication of diphtheria, the preschool group must be immunized. Babies should be immunized when they reach the age of 6 months.

Maternity Benefits in Sweden

THE question of maternity benefits has been receiving considerable attention in Sweden in recent years. For a number of years there has existed in that country a system of voluntary sickness insurance, which also included provision for maternity benefits. But because of the voluntary feature of the system, large numbers of women were left without insurance; to remedy this situation it was decided several years ago to make insurance compulsory, and a bill to that effect was introduced.

Early in 1931 a new bill, prepared by the Department of Social Welfare with the collaboration of specially invited experts, was introduced into the Riksdag. The new bill provides for insured women midwife's services and a maternity benefit of 2 kronor (53.6 cents) per day payable for at least 30 days, and for at least 42 days in the cases of women workers who are by law forbidden to return to work earlier than 6 weeks after confinement. Nearly one-half of the above benefit is to be supplied by the national treasury; the rest by the sick funds. An unusual feature of the bill is maternity benefits and midwife's care for non-insured women whose income is below a certain amount. The cost of this aid is to be met entirely by the national treasury.

Another government bill introduced this year makes provision for prenatal and postnatal care. The work is to be started at first only in four provinces. The main purpose of this work will be teaching of hygiene to mothers by specially engaged physicians and nurses. Arrangements are also to be made for coöperation between the midwives in public service and the social welfare authorities. The work is considered as a supplement to the existing maternity welfare work in Sweden.—*Sociala Modellanden*, Stockholm, No. 3, 1931; *Tidsskr. f. d. Barnavård och Ungdomsskydd*, Stockholm, Nos. 1 and 2, 1931, and translator's comments.

A Water-Borne Typhoid Fever Outbreak*

With Unusual Epidemiological Features

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SENECA Falls is a village of about 7,000 inhabitants, situated in the heart of the Finger Lakes Region of New York, and lies about 3 miles west of the northern end of Cayuga Lake and 9 miles east of the northern end of Seneca Lake.

Cayuga Lake, from which Seneca Falls receives its water supply, is about 37 miles long and from 1 to 3 miles wide, having a total area of about 60 square miles. The total population on the water shed is about 30,000, including the city of Ithaca which is situated on the southern end of the lake, has a population of about 19,000, and drains its raw sewage directly into the lake.

Both Cayuga and Seneca Lakes form a part of the New York State Barge Canal system. Mud Lock is situated at the outlet of Cayuga Lake through which all boats enter and leave this part of the canal system. Seneca River, now a part of the Barge Canal, flows into Cayuga Lake near Mud Lock. The current of the water normally is northward, joining the main portion of the Barge Canal at Montezuma. The level of the lake is maintained by a spillway located near Mud Lock. Seneca River receives the untreated sewage from Geneva, Waterloo, and part of Seneca Falls, a combined population of about 12,000, and is at all times highly polluted.

The water supply of the village of Seneca Falls is pumped from Cayuga Lake through a 16" pipe into pressure filters and from these it goes directly into the water system, composed of about 22 miles of iron pipe varying from 4" to 14" in diameter. The average daily amount of water pumped is 1,500,000 gallons. The intake pipe is about 3 miles south of the outlet.

With the normal flow of the lake toward the outlet the filter system has given fairly adequate protection to the water supply, although colon bacilli have been frequently present in the filtered water at certain times of the year.

* Read before the Epidemiology Section of the American Public Health Association at the Fifty-ninth Annual Meeting at Fort Worth, Tex., October 27, 1930.

The closing of the spillway of the Barge Canal creates a menace to the water supply of the village of Seneca Falls. This happens especially in the spring of the year when the level of the lake is high. At such times the water from Seneca River which forms a portion of the Barge Canal flows southward, reaching a point near and beyond the intake pipe of the Seneca Falls water system.

In the month of January, 1918, there was a sudden outbreak of diarrhea affecting a considerable number of people in the village of Seneca Falls. Investigations by the State Health Department showed that this reverse current from the northern end of the lake was probably the cause of the outbreak. Following this investigation the water board was urged to apply liquid chlorine constantly to the filtered water, and an apparatus was purchased soon afterwards, but not put in use.

In March, 1920, a similar, but more severe than the former, outbreak occurred under like circumstances. It was estimated that between 600 and 700 people in the village of Seneca Falls were affected with diarrhea and dysentery. The first case of this outbreak which lasted about 10 days and ceased about the time the gates were opened March 24, occurred March 15. A chlorinating apparatus was then installed and has been kept more or less constantly in use. Regular tests following this installation showed the water to be of a satisfactory quality.

A small number of typhoid fever cases followed both the 1918 and 1920 outbreaks of diarrhea.

On August 30, 1920, I received a telephone message from the Health Officer of Seneca Falls stating that typhoid fever was developing in a small portion of the village. This outbreak was very puzzling to him because the only common source of food or drink for the reported cases was the water supply, and inasmuch as tests made at the pumping station showed it to be of satisfactory quality, with no gas forming bacilli, he was unable to explain the outbreak, and I was requested to assist him.

I immediately went to Seneca Falls and learned that the outbreak had been preceded by cases of severe diarrheal trouble, one death from this cause having occurred August 28. This led me to believe that the outbreak was water-borne, and the officials connected with the water department were brought into conference and all facts concerning the outbreak were freely discussed.

The part of the village involved was a southwest corner adjacent to a large manufacturing plant employing from 700 to 900 people. This plant had an independent water supply from two sources, one a

deep well which furnished water for drinking purposes, and the other water pumped from the Seneca River part of the Barge Canal into large receiving tanks, and used only for flushing and cooling purposes. This plant was connected with the village water system at 2 points: one at Chapel Street and one at Heath Street. Single check valves served to prevent the back flow of water from the plant into the village system. This supply was not supposed to be used by the plant except in case of fire, but connections were made in order to secure lower fire insurance rates.

I also learned that the tanks containing water from the polluted stream were filled about August 9 and about that time there had been complaints from residents of the section of the village under question that the water was turbid. Little attention was paid to this as it was thought to be due to blind ends in the water system. Suspicion was immediately thrown upon the efficiency of the valves in the connection between the village and the manufacturing plant. It was ordered that they be immediately investigated.

Early the following morning these were uncovered and a hole was discovered in the one at Heath Street. It was estimated that about 7,000 gallons of water could pass through the hole. A hole was drilled in the pipe between the plant and the village water system and a pressure gage applied, which showed that the pressure in this pipe was greater than that in the adjacent village water system. Samples of water were taken from the hydrants in the neighborhood and were found to be highly contaminated with organic matter and other impurities. The connections between the plant and the village manufacturing plant were sealed and the water from the plant was shut out. Samples were again taken and the water was found to be free from pollution.

The section involved is on a lower level than the rest of the village and the supply is through 8" pipes from the higher level. It therefore was not possible to maintain a higher pressure in the village mains than in the pipes from the higher level. The system remained free from pollution and the water was found to be pure. People in this section were not affected by the disease.

The pipes connecting the plant and the village were sealed but a large hole was discovered in the pipe at Heath Street.

From the beginning of the epidemic 6 cases of typhoid fever were reported. These 6 had either lived or been in the village. In fact all of the cases used water in this particular section.

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Sil, 1931.

A thorough investigation of the milk supply showed that of the 8 milk dealers the percentage of milk sold to the people infected corresponded very closely to their total distribution, with 1 exception whose patrons resided largely in this section.

The manufacturing company employed experts for the purpose of showing that this epidemic was milk-borne. These efforts, however, were unconvincing and only tended to emphasize the correctness of our first suspicions.

The problem of handling such a large number of typhoid fever cases was a serious one. Seneca Falls had no adequate hospital facilities nor could we secure them in the nearby cities. It became imperative for us to make some provision for a temporary hospital. Inasmuch as this happened soon after the close of the World War, very few nurses were available. The Health Officer applied to the Red Cross for assistance and several possibilities for a temporary hospital were considered.

Following a conference on September 6, we were able to secure a portion of the Episcopal church which seemed to be admirably adapted to our needs. Beds were obtained from the barracks at Oswego, and were rapidly converted into practical hospital beds. Screens were installed in all windows and excellent facilities for cooking made available. On September 7, 5 patients were admitted. A total of 34 were cared for at the hospital during the outbreak. The total hospital days was 836. Nineteen nurses were employed, 10 for day and 9 for night duty. Care was given not only to the hospital patients but a visiting nurse service was established for those treated at their homes. The number of home visits was 467. In addition, clinics for free inoculation with antityphoid vaccine were established, and 375 people were given these preventive treatments.

The total cost of maintaining this hospital was \$5,309.60. The largest item was \$2,568, for nursing service.

There were 5 deaths, 3 in the hospital and 2 outside. The average age of those infected was 29.4 years.

COMMENTS

As the spoor of the wild animal unerringly leads the hunter to his prey so it is that certain epidemiological data just preceding the outbreak of typhoid fever blaze for us the trail which we shall follow in speedily tracing its source.

The average age of the victims gives us a strong hint as to whether it is a milk-borne or water-borne outbreak, but what is of greater value in tracing water-borne outbreaks is the knowledge that dysentery and

diarrhea have immediately preceded the typhoid cases in the same locality, and it was this fact that placed us on the water-borne trail in spite of the fact that only a small area of the village was infected, and the only food or drink which was partaken by all of the victims was the water from the common village supply. By following this trail we were able to locate the source within a few hours and check further infection.

The excellent service rendered by the Red Cross undoubtedly prevented a much higher death rate. I believe no well organized hospital could have given more adequate and efficient care than was given by the Red Cross service in this temporary hospital.

CONCLUSIONS

Cross-connections between a city water supply and a water supply of doubtful purity for manufacturing plants or other purposes should never be tolerated. No mechanical device for protection is fool-proof, and all devices designed to protect municipal water supplies against water of questionable purity have been legally eliminated in New York State since July 1, 1926.

BCG Vaccination

MY experiments provide no confirmation of the conclusion of Wilbert (Director of the Laboratory, Pasteur Institute, French Guinea) that monkeys can be completely protected against a virulent experimental or familial infection by vaccination with BCG given by the mouth or inoculated into the tissues. Some of the monkeys fed or inoculated with BCG showed no higher resistance to the test bacilli than the untreated controls. In other monkeys the disease produced though progressive was more protracted in its course and, but not always, less in extent than in the controls. . . . The strain of BCG used in these experiments can produce local lesions in the rhesus monkey, but these are always benign and do not lead to generalization.

BCG given by the mouth can pass through the mucous membrane of the alimentary canal into the adjacent glands and also gain access to the blood stream.

Vaccination with BCG, whether by feeding or by injection, has failed to give to monkeys the complete protection against tuberculosis reported by Wilbert, but in some instances may have produced a low grade of relative immunity.—Abstract, *Special Report Series, No. 152*, A. Stanley Griffith, Medical Research Council, 1931.

Inter-Chamber Health Conservation Contest*

LEROY A. LINCOLN

Chairman of the United States Chamber of Commerce Health Conservation Contest Committee

THE people of our country have, in large part, come to realize the importance of public health administration. They see it as a vital matter not only for the individual but for the community as a whole. The increase of population and the rapid growth of our cities have made it imperative that we control epidemics and protect their citizens, in every way science makes possible, from unnecessary diseases and premature deaths. This is a matter of the first importance to business and to the whole economy of the nation. When people are sick they are unable to do their work; there is loss in production and expense in treatment.

It is not ordinarily realized that the great advances which have been made in public health work are very recent. The expectation of life or the "average-after-life-time at birth" has increased about 18 years in the last 100 years. It was 41 years around 1930, and is now close to 59 years. But 10 of those 18 years have been gained since the beginning of the present century. In the earlier period there was an accumulation of knowledge of how diseases are caused and spread; in the last 3 decades we have been applying such knowledge to human betterment. The organization of public health administration, as a function of government, is relatively new. We are only now learning what great advances in human welfare are possible when the basic discoveries of modern medicine are generally applied. The public wants the benefits of the scientific discoveries and it is willing to tax itself within reason toward these ends.

There is still much to be done in the field of preventing disease and premature death. Experience not only in this country but all over the world has demonstrated that public health is purchasable and that expenditures made in this direction pay the best kind of dividends to the community.

And so it was that the Chamber of Commerce of the United States,

* Presentation of Awards to the winning cities in the 1930 Health Conservation Contest at the Annual Meeting of the Chamber of Commerce of the United States at Atlantic City, N. J., April 28, 1931.

two years ago, announced an inter-chamber health conservation contest. The Health Committee appointed by the Insurance Department Committee of the Chamber was convinced that many cities could reduce serious economic losses through improved public health organization. It was also believed that competition between cities would arouse interest over the whole country and result in better conditions. It was for this reason that the Inter-Chamber Health Conservation Contest was launched. The work was carried on under the auspices of the National Chamber with the coöperation of the American Public Health Association.

The first announcement in 1929 received an immediate and encouraging response from the local chambers of commerce. There were 140 cities in the first enrollment; in the second year, which has just closed, the enrollment was 208 cities. The entries geographically have been very widespread. Cities in 43 states, the District of Columbia and the Hawaiian Islands were represented this year. Twenty-one per cent of the cities are in the eastern section; 38 per cent in the central; 29 per cent in the southern; and 14 per cent in the western. The total population represented in the 208 cities was over 25 millions. On every side, the work of the contest was met with satisfaction.

The health officers, the local chambers, and the local business men who have interested themselves have appreciated to the full the value which the contest has had for their cities, the service which the field workers have rendered, and the excellent results which have followed.

The best proof of the favorable influence of the contest is that every city winning in this year's contest which had competed the year before showed a decided increase in its health score, as great as 30 or 40 per cent in some cases. While some of this improvement in the score may be due to better record keeping, there seems to be no doubt that distinct and definite advances have been made in community health accomplishments. Ninety-four per cent of the cities submitted schedules this year which showed from a moderate to a well-marked increase in score for public health services rendered and public health improvements effected, and this in spite of the fact that the requirements were made more exacting.

One of the important factors in this contest is the opportunity it has afforded to influential business men to serve on public health committees of local chambers of commerce and in this way to become acquainted with the local health problems. The contest has served to interest from 2,000 to 3,000 active and progressive business men to learn about their health departments, to see how they are administered, whether they are getting enough public funds, whether their

staffs are adequate and well trained—in short, to have a more sympathetic understanding of local needs.

The life insurance companies which are helping to finance the field work of the contest are cognizant of its value. They see the importance of the fact, look upon it as a real advance that the cities of the country are entering this contest, and are willing to study their health needs in a uniform manner, to follow standard practices, to increase budgets wherever necessary, and especially that they are securing the support and good will of their business men as represented in their local chambers of commerce.

In the year 1930, cities entered in the competition were divided, according to definite population groups, into 6 classes, thereby limiting each city's competition with those of comparable population. Following the winning city, the next 5 in each group have been given honorable mention and an engraved certificate will be sent to the local organization and the health department representing each city in the contest.

The winning and honorable mention cities in the respective groups are as follows:

CLASS I. (Cities over 500,000 population)

Detroit, Mich.
Milwaukee, Wis.
Philadelphia, Pa.
San Francisco, Calif.
Baltimore, Md.
Buffalo, N. Y.

CLASS II. (Cities 250,000–500,000 population)

Newark, N. J.
Cincinnati, O.
Rochester, N. Y.
Kansas City, Mo.
Denver, Colo.
Memphis, Tenn.

CLASS III. (Cities 100,000–250,000 population)

New Haven, Conn.
Syracuse, N. Y.
Yonkers, N. Y.
Hartford, Conn.
Utica, N. Y.
Reading, Pa.

CLASS IV. (Cities 50,000–100,000 population)

Racine, Wis.
Harrisburg, Pa.
Evanston, Ill.
East Orange, N. J.
Durham, N. C.
Pasadena, Calif.

CLASS V. (Cities 30,000–50,000)

Alhambra, Calif.
Salem, Ore.
White Plains, N. Y.
West Orange, N. J.
Watertown, N. Y.
Fargo, N. D.

CLASS VI. (Cities under 30,000 population)

Chestertown, Md.
Sidney, O.
South Orange, N. J.
Albany, Ga.
Palo Alto, Calif.
LaSalle, Ill.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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LIFE MEMBERSHIP

THE life and value of any scientific organization depend upon the quality and permanence of its membership, as well as upon the contributions which they make to the particular science to which the organization is devoted.

The American Public Health Association will hold its Sixtieth Annual Meeting in Montreal in September. It is, we believe, the oldest public health organization in the world, and one needs only to glance over its transactions to be assured that its membership has always included the leading men in the public health profession in the four countries whose citizens are eligible. Further study will show that every branch of public health has had expert consideration from the time its founder, the late Dr. Stephen Smith, published his epoch-making studies, up to the present. The Association has never gone out into the highways and byways in an attempt at numbers, though its doors have always been open to all who are seriously interested in public health or have made contributions to this end along any of the many lines embraced. In spite of the many special societies, the Association has always held its own as the parent organization. Its files contain discussions of every subject relating to public health brought up to date from year to year by experts.

There is danger of being swamped financially and otherwise in the

multiplicity of scientific societies, the pressure from which has been felt by all.

In 1928, constitutional provision was made for Life Membership in the Association to which any member or fellow is eligible. While membership in the Association is an honor, and fellowship takes recognition of the fact that one has been a member in good standing for a number of years, life membership is a still higher privilege, since it is granted only on the recommendation of a special committee which examines the qualifications and character of the applicant.

There are advantages to the holder of such membership as well as to the Association. The life member has no annual dues and no subscriptions to the JOURNAL of the Association to meet. His standing is assured in good times as well as those of depression. He has proved to the world his right to membership in this oldest of all organizations of its kind, and has shown the highest type of professional spirit.

From the standpoint of the Association, there is relief from the expense incidental to sending out annual bills and making collections. Further, it gives to the Association a permanent fund upon which it can count—an endowment, as it were—from those of its members who appreciate what it has done for them and the profession in which they are most interested.

Several very pleasing suggestions have been made by the committee in charge of this matter. Health officers and other health workers may be proposed by their associates or communities for Life Membership in honor of a Christmas, a birthday, an anniversary, or retirement. As such, it is a certificate of honor, as well as a recognition of faithful service.

Let us make the Sixtieth anniversary meeting of our Association memorable by the election of a large number of life members, and in so doing, renew our pledge to the world for the betterment of mankind and his environment.

LEE K. FRANKEL, PH.D.

LEE K. FRANKEL, President of the American Public Health Association in 1919, died in Paris on Saturday, July 25, in the 64th year of his age. He had been in Europe for 3 months conducting a study of social insurance and of the effect of the various insurance systems on the health and well-being of the people. In his death, the public health movement has lost a leader of distinction. Few did more than he to advance the movement along so many lines during the last quarter of a century.

Frankel's service was probably of the greatest value in the field of public health education. As the head of the Welfare Division of the Metropolitan Life Insurance Company since 1909, he enjoyed an extraordinary opportunity to spread the gospel of personal health and of community hygiene to every corner of the United States and Canada. Very early, he created an extensive popular literature which covered virtually every one of the communicable diseases and, in fact, every important aspect of personal hygiene. He succeeded in making the agency staff of his company a force for health promotion. Early in his insurance career, health officers and educators availed themselves of the opportunity to obtain the pamphlets and tracts prepared under his supervision for wide distribution among the general public and in the schools of the country.

Frankel advanced public health nursing possibly more than any other person of his generation. At the beginning of his work in the Metropolitan, he established a plan of coöperation with the visiting nursing organizations of the large cities of the country. Before very long, he had made satisfactory arrangements with these associations for nursing sick policy holders of his company over the entire area covered by its industrial business. In this way, the public health nursing movement of the country was substantially assisted and enabled to extend its operations in a manner that would have been thought impossible 25 years ago. It is also true that contact of the associations with the company resulted often in higher standards of bedside care, in the improvement of nursing records, in the establishment of a good accounting system, and in excellent supervision.

Frankel early established close contacts with health officers and others engaged in official health service, federal, state, and municipal. To all, he offered the coöperation of the company. Hundreds of campaigns were launched each year from his office to assist local health officers to popularize immunization against diphtheria, clean up the city, build tuberculosis sanatoriums, increase the municipal health budget, or check attacks on health service by those who were opposed to it.

His connection with the American Public Health Association began in 1909, when he became an active member. He was elected Treasurer in 1913, and his ambition was to build up the American Public Health Association until it became a leading force in public health work in America. He became President in 1919, and at once launched a campaign to increase the financial resources of the Association. He obtained large donations from sustaining members and directed a drive for a larger membership. Before his term of office was closed, the

Association had entered a period of expansion. The momentum of his activity carried it forward for 10 years until the membership and budget of the Association were more than doubled. His interest in the Association continued after his term of office expired and he watched its subsequent growth with pride. He was helpful in launching the Committee on Administrative Practice and in obtaining the first financial support which made the work of this committee possible. It was with much satisfaction that he saw its work extended from year to year until its activities included service to principal cities and states of the country.

Frankel was an extraordinary man in many ways. A gifted scientific investigator himself, he initiated and encouraged research in fundamental problems in the health field. He organized a number of demonstrations to discover how best to control tuberculosis and other communicable diseases. He developed a new public health literature. But probably the service by which he will be longest remembered is his demonstration that public health work, well conceived and administered, brings returns more than commensurate with its cost.

SHIBASABURO KITASATO, M.D.

THE death of Kitasato is of more than usual interest to bacteriologists and public health workers, in spite of the fact that for many years he has had very little touch with this country.

Born in 1856, he was sent by the Japanese Government to Germany in 1885, to study under Robert Koch, who at that time had reached the height of his fame, having announced his discovery of the bacillus of tuberculosis in 1882, and cholera in 1883.

Kitasato's fame will always rest upon his achievements in the isolation of the bacillus of tetanus in pure culture in 1889, his conjoint work with von Behring in which tetanus antitoxin was produced, which is held by many to have laid the foundation of modern serum therapy, and the discovery of the bacillus of bubonic plague in Hong Kong, in 1894. Yersin, during the same epidemic, isolated the germ independently.

In 1891, Kitasato returned to Japan, and a year later, established his private laboratory which was later subsidized by the government, and then taken over under the name of the Imperial Japanese Institution for Infectious Diseases. He created there a school of bacteriologists, among whom Shiga and Hata are especially well known.

A story is told in Germany that Kitasato was for a time very irregular in his attendance at the laboratory. One day Koch sent for

him, and told him that he would be returned to Japan promptly if he did not stick to his work. He disappeared for several days, and when he returned, brought with him a quantity of earth from which he isolated the germ of tetanus. For years afterwards, "Herr Kitasato's Tetanus Erde" was sold to students by the diener. A bottle of this earth is still among the mementos of the writer.

Kitasato was the recipient of many honors. In 1917, he was made a Member of the House of Peers by the Emperor of Japan, and in 1924, the title of Baron was conferred on him. He was a foreign member of the Royal Society of London.

WILLIAM CHARLES HASSLER, M.D.

IN the death, at the age of 63, of William Charles Hassler, City Health Officer of San Francisco, and President-elect of the American Public Health Association, the Association loses more than an officer and member of the Executive Board. He has been for many years a sincere, energetic worker for the interests of the Association. In 1920 he was our San Francisco host during the Annual Meeting. In 1930 he organized and was first president of the Western Branch, A. P. H. A., and increased the western membership more than four-fold in the past three years.

The extent of Dr. Hassler's administrative and public health ability has been too little appreciated outside San Francisco. Beginning his work with the Health Department shortly after his graduation from Cooper Medical College (now Stanford), in 1900, he was appointed Chief Sanitary Inspector of the City Health Department. He distinguished himself by establishing a registration office for births and deaths on the front porch of his residence on the first day of the 1906 earthquake and fire. Through his efforts and those of the U. S. Public Health Service in the enforcement of rat-proofing and inspection ordinances, bubonic plague, which occurred in 1906 and 1907, has never reappeared. He was appointed City Health Officer in 1915.

In 1918, his drastic enforcement of mask-wearing as an influenza control measure nearly cost his life by assassination. A bomb placed by a crank in his office failed to explode. In 1926 he was commissioned by the Surgeon General of the U. S. Public Health Service as a special representative at the Geneva Sanitary Conference. His continuity of policy for 31 years as a public officer has brought San Francisco unique advantages in the development of its health program.

Dr. Hassler became President-elect of the A. P. H. A. at the last Annual Meeting in Fort Worth, Tex. He would have assumed the presidency at the close of the Montreal meeting.

ASSOCIATION NEWS

SIXTIETH ANNUAL MEETING

AMERICAN PUBLIC HEALTH ASSOCIATION

Montreal—September 14-17

HEADQUARTERS—WINDSOR HOTEL

ENTERTAINMENT IN MONTREAL

THE Local Committee for the Montreal meeting makes the following preliminary announcement concerning entertainment for those who will attend:

On Monday evening, the opening day of the meeting, a dinner will be tendered to the Governing Council. This will provide an opportunity for the Governing Council to meet the representative body of Montreal citizens making up the Local Committee and representatives of the Federal, Provincial and Municipal Governments.

Following the general meeting on Monday evening, there will be dancing, and a buffet supper will be served.

An interesting event will be the garden

party which will be held on Mount Royal. At a spot known as Look-Out Point, the City has just completed a chalet which provides accommodation for a large number. Here afternoon tea will be served and a musical program will be given by the band of His Majesty's Grenadier Guards. From Look-Out Point, a panoramic view of the City is to be had. Beyond the City is seen the mighty St. Lawrence, and glimpses may be obtained of the Adirondack and the Green Mountain ranges. Transportation to Look-Out Point will be arranged.

The ladies will be invited to attend the Garden Party. A motor trip around the City has also been arranged for them.

SCIENTIFIC TRIPS

ARRANGEMENTS have been made for trips of general and scientific interest to various types of hospitals, large sewers under construction, filtration plants, incineration plants, milk pasteurization and industrial plants, the Radium Institute, and provincial and city health department laboratories.

The complete list of scientific trips will be published in the Entertainment Program, a copy of which each registrant will receive as well as the Final Program at the time of registration. Registration headquarters are located in Windsor Hall. The registration fee is \$2.00 for all delegates.

SPECIAL SESSION ON PUBLIC HEALTH ADMINISTRATION IN GREAT BRITAIN

THE following program has been arranged for Tuesday afternoon, September 15.

A Brief Review of British Public Health Administration. GEORGE F. BUCHAN, M.D., M.R.C.P., D.P.H., Medical Officer of Health, Willesden, London

Public Health and Public Assistance. SIR ALLAN POWELL, Public Assistance Officer, London County Council, London

The English Public Health Service—Education and Training. CHARLES PORTER, M.D., B.Sc., Medical Officer of Health, Marylebone, London

Maternal and Infant Services. JAMES FENTON, M.D., D.P.H., Medical Officer of Health, Kensington, London

NEW MEMBERS

Health Officers Section

- William R. Cameron, M.D., Hagerstown, Md.,
County Health Officer
Frank M. Fitch, M.D., Indianapolis, Ind.
(Assoc.)
Seth M. Kerron, M.D., Eugene, Ore., City and
County Health Officer
Frederick S. Leeder, M.D., Great Barrington,
Mass., Medical Director, Southern Berkshire
Health District
O. R. Taylor, M.D., Linden, Tex., Director,
Cass County Health Unit
Ralph Ten Have, M.D., Grand Haven, Mich.,
County Health Officer
William B. Terhune, M.D., Stockbridge, Mass.,
Chairman, Board of Health
Guy H. Turrell, M.D., Smithtown Branch,
L. I., N. Y., Health Officer

Laboratory Section

- Andrew Moldavan, M.Sc., Montreal, P. Que.,
Dairy Technician and Bacteriologist, Guar-
anteed Pure Milk Co., Ltd.
Edward J. Pugh, B.S., Wilkesbarre, Pa., Di-
rector, Kirby Health Center Laboratory

Vital Statistics Section

- Eleanor MacDonald, A.B., W. Somerville,
Mass., Statistician, State Dept. of Public
Health
Marguerite P. Potter, A.B., New York, N. Y.,
Statistician, Comm. on Neighborhood Health
Development

Public Health Engineering Section

- Martin E. Flentje, B.S., M.S., Harrisburg, Pa.,
Supt. Purification of Water Companies op-
erated by Community Water Service Co.
Onis M. Leonard, Frankfort, Ind., Director,
Dept. of Public Sanitation

Food, Drugs & Nutrition Section

- Helen Knowlton, M.A., Amherst, Mass., Asst.
Professor of Home Economics, State College
Enid E. Miner, Rock Springs, Wyo., Hospital
Dietitian, Wyoming General Hospital
A. Katheryn Royce, Burlington, Vt., Dietitian,
Mary Fletcher Hospital
Margaret R. Sandels, Ph.D., Tallahassee, Fla.,
Educator, Teaching and Investigations in
Nutrition, State College for Women
Eleanor F. Wells, B.S., M.A., Providence, R. I.,
Director, School of Homemaking, Y. W. C. A.

Child Hygiene Section

- C. Adele Brown, M.D., Oswego, N. Y., Medi-
cal Supervisor, City Schools
Dr. Mary A. Wilson, Newark, N. J. (Assoc.)

Public Health Education Section

- Harry S. Thomson, L.D.S., D.M.D., Toronto,
Ont., Field Secretary, Canadian Dental Hy-
giene Council

Public Health Nursing Section

- Anna L. Hartmann, R.N., Kirkwood, Mo., St.
Louis County Health Dept.
Marguerite K. Jacobsen, R.N., New York,
N. Y., Associate Director, Health Service,
Cleanliness Institute
Adele L. Kuhle, R.N., Clayton, Mo., Public
Health Nurse
Margaret Reddington, R.N., St. Joseph, Mo.,
County Public Health Nurse
Beatrice M. Sibley, B.S., Union City, N. J.,
Supv. of Nurses, Metropolitan Life Ins. Co.
Martha B. Waltmire, R.N., Perry, Fla., County
Health Nurse

Unaffiliated

- R. Gautier, M.D., Singapore, S. S., Director,
Health Organization, Eastern Bureau, League
of Nations (Assoc.)
Dr. R. Subramaniam, New York, N. Y., temp.,
Public Health Service, Madras, India (Assoc.)

DECEASED MEMBERS

- Dr. Eugene Lyman Fisk, New York, N. Y.,
Elected Member 1915, Fellow 1922
Lee K. Frankel, New York, N. Y., Elected
Member 1909, Fellow 1922
W. C. Hassler, M.D., San Francisco, Calif.,
Elected Member 1916, Fellow 1922
Wilson F. Monfort, St. Louis, Mo., Elected
Member 1908, Fellow 1922
Edward L. Creeden, M.D., New York, N. Y.,
Elected Member 1927
William S. Keister, M.D., Towson, Md., Elected
Member 1913
Thomas D. Maher, M.D., San Francisco, Calif.,
Elected Member 1929

APPLICANTS FOR FELLOWSHIP

- HEALTH OFFICERS' SECTION: Joseph W. Moun-
tin, M.D., Washington, D. C.
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PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

Health Demonstration in New York City—The work of the Bellevue-Yorkville Health Demonstration in 1930 was concentrated largely in co-operating with the Department of Health in working out an effective plan of local health administration. Two special projects were undertaken. One thousand children of 13 and 14 years of age were examined for tuberculosis to ascertain the kind and amount of tuberculous infection in a cross-section of the child population. Each patient was given a physical examination, tuberculin test, and X-ray of the chest. An intensive educational program to acquaint the population with the dangers of the venereal diseases was also instituted.

During 1930 each nurse in the Yorkville District averaged a case load of 331 patients in 227 families, and was responsible for the health work in at least one school and averaged nearly 3 half-days a week in clinic work.

No death from diphtheria occurred in the district during 1930. In fact, there has not been a death since August, 1929, although 94 cases of diphtheria were reported in 1930. A house-to-house canvass by nurses disclosed the fact that in 253 families there were 502 children between the ages of 9 months and 10 years. Of these, 283 had been protected against diphtheria and 219 had not received such protection.—Bellevue-Yorkville Health Demonstration, Milbank Memorial Fund, 1930.

Typhoid Fever in Ohio River Cities—An epidemiological study has been made of the possible relationship to the public water supply of the resi-

due in typhoid fever cases in 6 Ohio River cities. Included in the study are East Liverpool, Steubenville, Wheeling, Ashland, Ironton, and Portsmouth. The Ohio River is the source of the public water supply of each city studied. While originally supplied with untreated water, at the time of the study all 6 supplies were treated by coagulation-sedimentation-filtration and disinfection with chlorine.

During the period of raw water consumption the typhoid fever incidence in each city was uniformly very high in every month of the year. Following the installation of treatment systems, the typhoid fever incidence fell to a low rate comparable to that enjoyed by cities with safe water supplies. Also the seasonal distribution changed so as to give a definite summer and fall incidence. An epidemiological study of reported cases during 1927 and 1928 failed to reveal any evidence that the public water supply was a factor in the transmission of typhoid fever.—M. V. Veldee, *An Epidemiological Study of Typhoid Fever in Six Ohio River Cities*, *Pub. Health Rep.*, 46, 1460 (June 19), 1931.

Eradication of Syphilis—Four persons per 1,000 of the population or nearly half a million persons in the United States are constantly under treatment on account of syphilis. In urban areas the rate is 5 times as high as in rural areas and there are half again as many cases among males as females.

Information furnished by practising physicians in New York State exclusive of New York City indicates that in 1930 there were 2,800 more cases of syphilis under treatment than in 1927.

The health officer, although interested in movements for social betterment, can most profitably restrict his activities to the application of effective well known medical and public health procedures. Briefly, the control of syphilis involves two elements: first, that every infected person must take treatment; and second, that facilities for diagnosis and treatment must be made freely available.

Legal aspects of the control problem involve case reporting, notification of sources of infection, compulsory treatment, and quarantine of irresponsible persons.

The medical service should include laboratory diagnostic facilities, adequate clinical services, free distribution of drugs, payment of physicians in rural areas for treating those unable to pay, and prophylaxis.

Among the epidemiological measures are: inquiry to determine source of infection, examination of contacts, and concentration of effort where necessary in early cases. Medical social service should be available to physicians as well as to clinics, to make family adjustments and to return lapsed cases for treatment. Educational measures should include the training of personnel, which includes the physicians, nurses, and social workers, education of the public and education of the patient.

The New York State program for the control of syphilis includes the establishment of a state-wide and state-aided system of county boards of health under the direction of trained, full-time health officers.—Thomas Parran, Jr., *The Eradication of Syphilis as a Public Health Objective*, *J. A. M. A.*, 97, 73 (July 11), 1931.

Rural Health Program—On February 6, 1931, Congress appropriated \$2,000,000.00 for the promotion of rural sanitation in drought stricken areas. The restrictions on this appropriation

are not like those imposed upon the Public Health Service in the administration of rural health work elsewhere than in the drought stricken region. It is not required that at least 50 per cent of the total cost of any project be defrayed from local sources. The appropriation is of an emergency character and terminates on June 30, 1932. Twenty-two states are considered as being included in the drought stricken areas.

An opportunity is presented to demonstrate the value of properly organized local health work. There is need for the further development in the Public Health Service of—(1) an adequate consultation and advisory service, (2) a service to develop better trained public health personnel, and (3) the extension of studies, surveys and experimental demonstrations with the view of obtaining additional knowledge with which to increase the effectiveness of public health administration generally, and produce more satisfactory results.—W. F. Draper, *Some Essential Considerations in Connection with the Rural Health Program*, *Pub. Health Rep.*, 46, 1617 (July 10), 1931.

Health Demonstration in China—With the financial aid of the Milbank Memorial Fund, there has been established in a rural county of North China with a population of 400,000 a demonstrational health unit. Ting Hsien is 85 per cent rural, the largest city containing 13,556 inhabitants, and there being 472 scattered villages. The health demonstration area includes the city and the neighboring 72 villages, a population of approximately 50,000.

Over 90 per cent of the people are illiterate. Most of them are poor, ignorant, and superstitious. The chief causes of controllable mortality are smallpox, gastrointestinal diseases, tetanus neonatorum, and tuberculosis. During the first year of the demonstra-

tion particular emphasis has been placed upon health education, improvement of the local water supplies, vaccination against smallpox, and the promotion of social hygiene.—Hsun-Yuan Yao, *The First Year of the Rural Health Experiment in Ting Hsien, China*, Milbank Memorial Fund, *Quart. Bull.*, July, 1931.

Diphtheria Prevention in Philadelphia—During the month of June for each of the past 4 years, the Health Department has carried on an intensive campaign to secure the protection of

preschool children against diphtheria. In June, 1931, there were 85 school clinics in addition to the 9 regular health centers at which this service was given free of charge to those who applied. In 1928 protection was given to 24,800 preschool children. In 1929 the number protected was 20,400, while each of the two years 1930 and 1931 protection was given to 21,000 preschool children. This work has resulted in a reduction in the incidence of diphtheria.—*Health-fax*, Philadelphia Department of Health, June 29, 1931.

LABORATORY

JOHN F. NORTON, PH. D.

A COMPACT APPARATUS FOR THE DETERMINATION OF CARBON MONOXIDE BY THE IODINE PENTOXIDE METHOD

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IN order to conserve working space, an improved and portable apparatus for determination of carbon monoxide in air by the iodine pentoxide method has been designed and perfected. It has all the salient features of our older and larger type,¹ and other features which give it an advantage over the former apparatus.

Figure I shows the construction of the apparatus. A framework, V-V, is attached to a base Y. The various absorption towers and other pieces of apparatus are arranged around this framework in series. The sample is introduced into the apparatus at either T or S, depending on whether it is to be collected by continuous flow or from a gas-sampling bottle. R is a three-way stopcock which controls these openings.

The sample passes from the inlet to the towers O and M, containing concentrated sulphuric acid, to remove most of the moisture; then to K, concentrated sulphuric acid heated to 150° C. by means of an oil bath, E, to absorb the heavy hydrocarbons, most of the gasoline, and the methane; then to C, cold concentrated sulphuric acid, to catch any of the fumes liberated from K; then to A, activated charcoal, which removes the last traces of unburned gasoline and hydrogen; next to B, soda lime, and to D, dehydrite, to remove carbon dioxide and the last traces of moisture. These absorption towers are connected to a hard glass U-tube, G, containing iodine pentoxide, immersed in the oil bath, E, kept constantly at 150° C. by means of a thermostat, I.

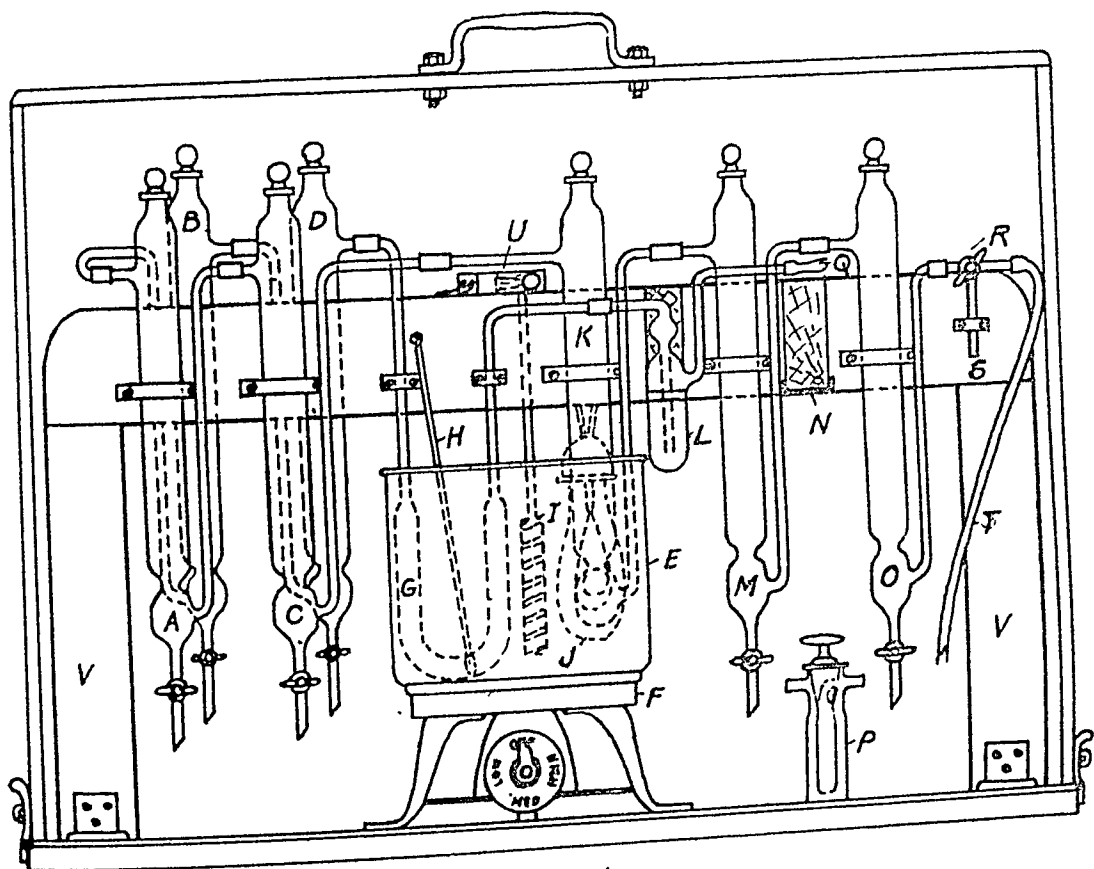


Figure 1.

and electric light, J, connected in series. U is a microfarad condenser attached to the circuit to prevent unnecessary sparking.

The liberated iodine is finally absorbed in a specially constructed absorption bulb, P, containing 5 c.c. of 10 per cent potassium iodide. This bulb is connected at Q, and fits into the bracket N. Trap L prevents any of the solution in P from being drawn back into the tube containing the iodine pentoxide. The outlet end of the bulb P is connected to a standard meter, which registers the volume of gas flowing through the apparatus. The heating of the oil bath is done by means of an electric stove, F.

In case electricity is not available, the heating may be done with an alcohol lamp or oil stove. Thermometer H

indicates the temperature of the bath. The gas is drawn through the apparatus by means of an electric pump, for which a water pump or a series of aspirating bottles can be substituted when electricity is not available.

The space occupied by the new apparatus is much less than that required by the older type. By attaching the wooden case, Z-Z, which is held in place by means of catch-locks, X-X, the apparatus is made portable and can be carried from place to place with the handle W. By its use accurate determinations of carbon monoxide in air can be made in the field.

REFERENCE

1. Martinek, M. J., and Marti, William C. Modified Iodine Pentoxide Method for Determination of Carbon Monoxide in Air and Blood. *A. J. P. H.*, XIX, 3: 293 (Mar.), 1929.

QUANTITATIVE DETERMINATION OF ODOR IN WATER

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THE past five years have seen a wonderful response in the art of water purification to the public demand for water free from odor and taste. There are now a surprising variety of methods of recognized value in prevention and removal of tastes and odors, an excellent summary of which is contained in a paper by Paul Hansen, presented at the last convention of the A. W. W. A. Equally surprising is the fact that these methods have grown up without any yardstick by which to measure results or existing conditions.

It is not practical nor safe to determine taste indiscriminately on raw and partially purified waters, but fortunately most tastes are represented by odors. However, the determination of odor according to *Standard Methods* of the A. P. H. A. is not in any sense a quantitative determination, but merely the record of the opinion of the observer based on a momentary impression which cannot be recorded and referred to for comparison. While this method is the one which has been used generally, it must be obvious that it is not very useful in measuring the merits of odor removal processes—a problem of practical importance. Without a quantitative measure one can only guess at what to do and when to do it.

A method that does make possible a quantitative record of odor has been used by the author and others during the past few months. This is a determination of the threshold number which may be defined as the reciprocal of the highest dilution of the water which can be distinguished from odor-free water.

Example: 1 ml. of an unknown mixed with 99 ml. of odor-free water

can be distinguished from 100 ml. of odor-free water, while a higher dilution cannot; the odor or threshold number is 100. If a dilution of 25 to 100 is required to distinguish, the odor is 4, and so on.

ODOR-FREE WATER

Water free from odor is prepared by boiling distilled water. Usually we find the odor present in the distilled water is not entirely removed until 10 per cent or more has boiled away. The steam may be cautiously inhaled from time to time to note when removal of odor is complete. Cool to water temperature.

PROCEDURE

Make up a series of dilutions of the unknown to 100 ml. each, using odor-free water. Place in 500 ml. Erlenmeyer flasks previously marked. Cover flasks with well fitting watch glasses. The range of the dilutions will depend on the quantity of odor present. The highest dilution should contain less than the amount required to distinguish; while the lowest dilution will contain more than minimum amount required. Large steps of dilution will necessarily be employed until the proximate range is located. Finally, the steps should increase by increments of 20 per cent, as the method is of this accuracy or better.

A blank flask contains 100 ml. of odor-free water. Take one of the series of dilutions, shuffle with the blank and attempt to distinguish. The observation is made by shaking the flask vigorously for 1 or 2 seconds, lifting the watch glass and inhaling deeply from the mouth of the flask. If the unknown

can be identified, a higher dilution is tried, or *vice versa*.

To check an observation it is usually necessary to prepare a fresh dilution, since the vigorous shaking and aeration is likely to make a perceptible difference in the threshold odor when repeated.

The flasks used should be steamed out by boiling water before using. The hands should be clean and free from odors such as tobacco, soap, etc. The necks of the flasks should be immersed occasionally in boiling water.

Getting the proximate range of the odor may be tedious until experience is acquired. Several hours may be consumed before definite decisions can be made on a single sample. Results are obtained more rapidly by working from

lower dilutions to higher, as the intensity of odor in the lower dilution suggests the next higher step and seems to sensitize the observer to the test. Eventually, 10 to 15 minutes per sample will suffice for unknowns; while for plant samples in which the range can be predicted less time will be required. The method may be used for hot as well as cold odors. In the case of hot odors a temperature of 65° C. is about the limit of nasal tolerance.

We have not thus far noted any marked discrepancy in the results obtained by this method in the hands of trained, conscientious observers. There does seem to be considerable diffidence in the beginner resembling the first efforts of a child to walk, and the results may be somewhat erratic at the start.

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Mortality by Age Groups in Wisconsin, 1930—Recent press notices, released by the Wisconsin State Board of Health, contain interesting information concerning the chief causes of death at certain age periods in that state during 1930.

For infants under 1 year of age, the chief cause of death was premature birth, which was responsible for nearly a third of the total deaths at this age. From ages 1 to 4, the highest mortality was caused by pneumonia; from 5 to 19, by accidents; from 20 to 39, by tuberculosis; and above the age of 40, by heart disease.

The important rôle played by accidents in the mortality record is shown by the fact that after the first year of life up to the age of 50, it was one of the three leading causes of death. Dur-

ing early childhood, ages 1 to 4, more deaths were attributed to this cause than to any one of the much feared childhood diseases of measles, diphtheria, scarlet fever or influenza. From 5 to 19, it was the outstanding cause of mortality, and during the period 20 to 39 it was exceeded only by tuberculosis. Even during the 40's and 50's, it was, next to heart disease and cancer, the chief cause of death.

Despite the great strides made during recent years in the reduction of tuberculosis, this disease caused more deaths between the ages of 20 and 40 in Wisconsin during 1930 than any other disease or condition. With the exception of accidents this disease was the leading cause of death, also during the age period 15-19. While the white plague may never regain the ascendancy it

once held in the general death rate, it is evident that, at least during this period of life, there is still room for much improvement.

Heart disease, as might be expected, was an important mortality factor throughout the life span. After 40, it was the chief cause of death, while in each earlier age group it was well up among the six leading causes.

Another disease which predominated throughout the entire span of life was pneumonia. At no age did it hold a position in the frequency scale lower than sixth and, as previously stated, during early childhood it was the most important cause of death.

That cancer, as a cause of death, should be exceeded only by heart disease in the late years of life was, of course, to be expected. But it will surprise many to find this disease among the ten leading causes of death during adolescence and early maturity.

The full significance of the figures pertaining to puerperal mortality in Wisconsin is not brought out by this study, since they relate to the total population instead of to females alone. If this distinction had been made, this group of causes would have figured even more prominently as a cause of death than now appears. As it is, some idea of the importance of puerperal conditions among the leading causes of death in Wisconsin may be derived from the fact that they averaged about fourth in rank throughout the ages 15 to 34. In the absence of specific figures, it is probable that among women within this age period, more lives are lost as a result of conditions accompanying childbirth than from any other cause, excepting tuberculosis and possibly accidents.

Other causes that merit attention are appendicitis and suicides. The former was one of the chief causes of mortality from the age of 3 to age 50. It ranked particularly high during childhood. At ages 5-14, it was exceeded only by acci-

dents, and at age 3-4, by pneumonia, diarrhea and enteritis, and accidents in the order named. Suicide remained continuously among the chief causes of death from age 20 to 69, maintaining an average rank of about seventh throughout this period.

The results of this study point to the practical advantage that might be derived from an analysis along these lines of similar material covering a more extensive territory such as the United States Registration Area.

Mortality Statistics for France—The Service de la statistique generale de la France has published a volume of general statistics for 1928, from which were made several excerpts for the *Siècle medical*. Of the 674,046 deaths recorded in France in 1928, 344,999 were of males and 329,047 were of females.

The mortality rate is thus 16.6 per 1,000 of population, or 17.6 for males and 15.7 for females. It is evident, therefore, that the mortality rate for males is higher than for females, as is nearly always the case. The excess amounts to 19 per 10,000, or to 12.1 per cent—a wide difference, and yet not so great as the differences that appear on analysis of the deaths and classification according to age groups. For instance, in the 10 to 24 age groups the number of deaths of females is greater than that of males, and particularly in the 15 to 19 groups, a result that may be attributed in part to childbirth and in part to the reduced resistance brought about in woman by the onset of puberty. But from age 24 on, the tide turns the other way, and in the 45 to 59 year age groups the mortality of men is about 50 per cent higher than that of women.

One condition which prevents drawing from the official statistics all the conclusions that would have value from the standpoint of public health is the large number of deaths recorded as

"cause unknown." Such statements are found more frequently in the large cities than in the rural districts, which is something of a reflection on the acumen of city practitioners.

In Dijon 635 deaths out of 1,000 are recorded by practitioners with the statement "cause unknown"; in Marseilles there are 599 out of 1,000, and in Grenoble 159 out of 1,000; whereas in the departments in which these cities are located the proportion, exclusive of these cities, ranges from 4.95 to 105.

It is possible that in some instances the rural practitioners pretend to have established a more precise diagnosis than is justified by the facts, and that the physicians of the large cities are more modest in their statements. It is to be considered also that necropsies, the only guarantee of a precise diagnosis, are seldom performed in the rural districts, whereas they are much more frequent in the large cities, where there are hospitals. It is, however, gratifying to note that the number of deaths from unknown causes is decreasing from year to year.

In the department of the Seine, the statistics show only 18 deaths per 1,000 as due to "unknown causes," as against 61 in 1925. But the proportion is still 569 in the department of Landes, in southwestern France, and appears to correspond to the greater or less perfection in the organization of the medical service.—*J. A. M. A.*, 97: 114 (July 11), 1931.

Trends in Population Increase and Distribution Among States During 1920-1930—The 1930 U. S. Census shows an increase of 17,064,426 persons during the past decade as compared with 13,738,354 during 1910-1920, while the respective rates of growth appear as 16.1 per cent and 14.9 per cent. If allowance is made for the change in the dates of enumeration, April 15, 1910, January 1, 1920, and April 1,

1930, and if a period of exactly 10 years is used, the 1920-1930 increase becomes 16,648,000, or 15.7 per cent; and the 1910-1920 increase 14,151,000, or 15.4 per cent. On this basis the rate of growth for the decade just past is only very slightly in excess of that of the preceding one. Both of these rates are well under that of the 21.0 per cent for the 1900-1910 period.

Comparing 1930 with 1920 there was a decline of nearly 16 per cent in the number of births, and of 31 per cent in the excess of births over deaths. The number of deaths has been fairly steady since 1920, although showing a slight increase as the population has grown. Net immigration varied widely from 1920 to 1923, but under the quota system since 1924, it has been fairly stable, though declining slightly. The excess of births over deaths has been much more important than net immigration in contributing to population growth, for only in 1920 and 1923 did less than four-fifths of the gain come from natural increase.

In 1930, the excess of births over deaths was over 11 times as important as net immigration in contributing to population growth. Although the largest excess of births over deaths occurred in 1921, the largest gain in population occurred in 1923, due to heavy immigration. The gain in population in 1930 was only 56 per cent of that in 1921 and 52 per cent of that in 1923. With only 1,110,000 persons added to the population during 1930, and with each year since 1923 showing a smaller increase than its predecessor, it is almost certain that the 1930-1940 gain will be less than 12,000,000, and quite likely that it will be as low as 9,000,000. This would mean a rate of growth of from 7.5 per cent to 10 per cent and a 1940 population of between 132,000,000 and 135,000,000.

California and Florida had the largest rates of increase in population be-

tween 1920 and 1930 with Michigan, Arizona, New Jersey, Texas, North Carolina, Oregon and New York all gaining over 20 per cent. Of these states, New Jersey, New York, California, and Michigan are primarily industrial and commercial; North Carolina and Texas have been experiencing a rather rapid industrial development and urban growth. Possibly the rapid increase of New York is the most surprising of these states. About three-fifths of its growth took place in New York City, which might have been expected to grow considerably less rapidly because of its size and population density. Probably the same factors that brought about this rapid growth in New York City were responsible for so much of the gain in New Jersey occurring in the northeastern part of the state, and for Connecticut being the only one of the New England states to grow as rapidly as the nation as a whole. States whose rate of growth was under 10 per cent during the decade just ended include Maine, New Hampshire, and Vermont; all of the West North Central states; and Delaware, Virginia, South Carolina, Georgia, Kentucky, Arkansas, Montana and Idaho. Barring Delaware, these are either New England states or states in which agriculture is the important occupation.

The greatest shifts in rate of growth during 1920-1930 as compared with the preceding decade were the declines that occurred in the Mountain states. Although New Mexico and Nevada grew faster than in 1910-1920, the rate for the division as a whole was cut from 26.7 to 11.0 per cent. In the balance of the country, the larger declines (i.e., amounting to one-fourth or more) occurred in Massachusetts, Connecticut, Ohio, Minnesota, Iowa, North Dakota, Nebraska, Delaware, Virginia, South Carolina, Georgia, and Arkansas. Barring Ohio and Delaware, the statement made above regarding states with a rate

of growth of less than 10 per cent may be repeated for states whose rate of growth declined decidedly; namely, they are either New England states, or agricultural states.

The rural rate of increase of 8.8 per cent during 1920-1930 is slightly larger than that of 6.8 per cent for 1910-1920, while the urban rate of 23.1 per cent is slightly less than that of 24.5 per cent for the earlier decade. According to statements made regarding the economic situation of agriculture and urban industries, it would be expected that the situation would be reversed, that the rural rate of increase should have been lower in 1920-1930 than in the previous decade and the urban rate higher. A considerable part of the rural increase in recent years is due to the development of "acre-lot colonies" along the roads near cities and towns and has no connection with agriculture. Thus, the rural population in Massachusetts, Connecticut, New York, New Jersey and Pennsylvania increased 1,085,345 from 1920 to 1930, by far the greater part being due to city workers seeking country homes.

On the other hand, Indiana, Illinois, Wisconsin and the 7 West North Central states (which comprise about the best of our farming area) had a gain in rural population of only 70,452, Iowa and Missouri even losing 48,549 persons from rural communities. In the remaining states the situation is not so clean-cut.

The rural increase of 648,801 in California, the largest of any state, is probably more suburban than agricultural. In Texas, North Carolina, and Oklahoma, where the gain in rural population totaled 943,429, the greater part undoubtedly was agricultural, due to the expansion of cotton farming into areas relatively free from the boll weevil. On the whole, however, it is evident that "acre-lot colonies" contributed a large share, certainly two-fifths and probably

over one-half, to the rural growth, and that without this new development, the 1920-1930 rate of rural gain would have been still farther under the urban rate for this decade, and well below the rural rate for 1910-1920.—P. K. Whelpton, *Population Trends in Population Increase and Distribution during 1920-1930*, *Am. J. Sociol.*, 36: 865-879 (May), 1931.

Ten Years of Legalized Abortion in Soviet Union—On the tenth anniversary of the existence of legalized abortion in Russia (Nov. 20, 1930), Boyko makes an extensive survey of it. Russia is the only country in the world in which abortion is legalized and every woman has there the right to request that it should be performed if there are present any indications of a social character.

The author recalls the situation in Russia in the prerevolutionary days. The well-to-do classes got the best specialists and the poor people were left to the mercy of ignorant midwives or were left alone entirely without any help whatever. They paid heavily for it, mostly by their lives or by various chronic ailments which developed after unattended labors.

The aim of all Russian health departments throughout the country now is to take away the initiative from the criminal abortionists and shift it to the legal channels for a modern hospital. In spite of legalization, for the years 1922, 1923 and 1924 there were recorded in Russia 3,000 deaths from criminal abortion in the small villages of the republic of Russia proper (not of the whole union). The author stresses that these figures are far from complete.

The law requires that to every woman who applies for an abortion must be explained the risk of it to her life and future health. There is outlined a defi-

nite plan of indications of a social nature for abortion, and the government opened all over the country many so-called abortaries, most of them free. Abortion in Russia is at present accessible to every woman.

The following legal changes have been introduced lately: (1) The time limit is 3 months. If there is any medical indication, no limit in time is necessary. (2) Repeated abortions are not allowed until 6 months has elapsed since the last pregnancy. (3) The patient has to stay in bed for 3 days. (4) The attending physician has the right to refuse to perform an abortion and he has to refuse it when he finds a contraindication from the medical side.

The legislation on abortion in Russia met a flood of criticism, especially abroad. The claim was that such a law would lead to the degeneration of the nation. The author disproves this assertion, stating that it has no ground whatever. He shows that the birth rate in Russia for each 1,000 of population was: in 1911 (prerevolutionary), 43.8; 1923 (after the revolution), 42.2; 1924, 42.9; 1925, 44.2; and 1926, 43.2. In 1929 the net increase in population of Russia was 23 for each 1,000, while in France it was 1.3, and in England, 3.4. The total increase in population is at present $3\frac{1}{2}$ million yearly.

The motives on which abortion is asked for in Russia were as follows: poor economic conditions, 48 per cent; desire to hide pregnancy, in large towns, 0.5 per cent; in country places, 4.1 per cent; various sicknesses, 21.6 per cent; the presence of a nursling in the family, 6.8 per cent; desire not to have a child, around 10 per cent. Legalized abortion is the only means for women's emancipation because there are not yet any contraceptives that prevent pregnancy with certainty.—*J. A. M. A.*, 97: 218 (July 18), 1931.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

SANITARY ENGINEERING IN A COUNTY HEALTH DEPARTMENT *

R. E. COOK

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SUFFOLK County occupies the eastern two-thirds of Long Island and has an area of about 920 square miles. It is 90 miles long and varies in width from 12 to 20 miles. It is a county of small communities, having 48 with a population of 1,000 or more, the largest with only 11,000. The total population of the county is about 160,000 but this is greatly increased in summer by the thousands of people who enjoy the recreational advantages of the seashore. Moreover, the permanent population showed an increase in the last decade of 50 per cent, which is much larger than in the preceding 10 years.

Suffolk County consists of 10 townships and 28 incorporated villages, making 38 separate health districts before the establishment of the County Health Department. These 10 towns vary in population from 1,000 to 30,000 people and in size from one of the smallest towns in the state to the largest, which is almost as large as the combined area of the three counties which constitute the remaining one-third of the Island. Moreover, only 11 of the 48 communities mentioned are incorporated. These communities have spread beyond their boundaries so that in the largest community about one-third of the popula-

tion lives outside the incorporated limits.

With such rapid growth and overlapping of town and village jurisdictions, a county health department with adequate power and a full-time personnel was distinctly needed, and one was organized in November, 1928. It was the second in New York State and the first organized entirely by the people of the county.

With its organization the local boards of health, except in the 7 villages having a population of over 3,000, were abolished and the boards of health and health officers in these 7 villages were placed under the supervision of the County Board of Health, which immediately fell heir to all the sanitary problems in the county. The department as organized consists of a Board of Health of 7 members, a commissioner, deputy commissioner, sanitary engineer, veterinarian, two milk and dairy inspectors, bacteriologist, two clerks, several nurses and part-time assistant deputies.

The duties of the sanitary engineer in a county health department, or of the county sanitary engineer, may be divided into two broad divisions—that of assisting the Engineering Division of the State Health Department in the protection and supervision of the public water supplies and of the installation and operation of sewer systems and sewage disposal plants, and as agent of the local board of health in dealing with

* Abstract of paper presented before the New York State Sewage Works Association at Freeport, L. I., N. Y., June 5, 1931.

local problems in sanitation as herein-after discussed.

The county sanitary engineer supplements the work of the state on one hand, and acts as consulting engineer to the town and village authorities on the other. In no way, however, does he interfere with the professional consulting engineer, but on the contrary does a great deal to stimulate the engaging of competent sanitary engineers by local authorities in order properly to carry out his recommendations.

The promotion of sanitation in communities is a very important duty and one that is difficult to evaluate, as it is chiefly accomplished by personal contacts and conferences with the authorities and civic organizations in these communities.

WATER SUPPLY

The chief and most important duty of the state and county sanitary engineers is the protection and supervision of the public water supplies. In New York State the State Health Department has full authority over the sanitary conditions of public water supplies, but as there are over 600 of these, it is difficult for the State Health Department to maintain continual careful supervision over all. It therefore devolves upon the local health department, in this case the county sanitary engineer, to maintain such close supervision and to do the necessary field work. He is greatly aided in this work by the existence of a laboratory in the County Health Department with a competent bacteriologist in charge.

In Suffolk County there are 31 public water supplies, 2 of which were recently discovered. These range in size from one serving about 100 to one serving about 50,000 people. Of the 48 communities having a population of over 1,000; all but seven, or 72 per cent of the population, are served with public supplies and these 7 communities will

soon have public supplies. All these supplies except 2 are derived from wells, chiefly shallow wells, as Long Island is underlain with an extensive and practically pure ground water supply which is cheaply and easily obtainable. This fact somewhat prevents the extension of public water systems in the smaller communities, as it is comparatively easy for the home owner in a sparsely settled village to drive a small shallow well and derive fairly pure water at small cost.

During the last year samples of water have been collected from all water supplies once a month and a sanitary inspection of each supply is made at the same time. The rapid growth of population, and the consequent construction of many new houses, necessitates a careful watch by the county sanitary engineer on the sources of supply in order to prevent the location of any cesspool or other source of pollution near the supply. In some cases, the engineer supervises the installation of proper individual disposal plants placed beyond the required minimum distance from the wells. In other places he has helped to eliminate sources of possible pollution. In some instances where the presence of organisms of the *B. coli* group had been indicated, the seeming contamination was due to defects in the system and was soon cleared up.

The 7 chlorination plants in the county are inspected semimonthly, residual tests for chlorine are made, advice to the operator on the operation of the chlorinator is given and a check-up is made on the report furnished by the operator to the State Health Department. The maintenance of a residual of chlorine of at least 0.1 p.p.m. has been rigidly adhered to. Except for the 2 surface water supplies, the chlorine demand of the waters in Suffolk County is extremely low and careful control over chlorination must be maintained in order to prevent tastes due to over dosages.

The county sanitary engineer is frequently called upon to inspect and report upon the sanitary condition of many private water supplies. In the first year of the laboratory, 47 of these supplies were examined. Including public supplies, the total number of samples collected by the sanitary engineer during that year was 200.

He is also called upon to assist communities in the securing of more palatable water supplies, a service not necessarily of a sanitary nature, but yet somewhat affecting public health because if the taste of a public supply is unpleasant, the people will complain to the Health Department and tend to drive their own wells, which, in the built-up sections, will be more or less contaminated.

In particular, a certain village had a water supply which was high in salt content, high in iron, carbon dioxide and with a low pH. Under the recommendation of the county sanitary engineer, a new piece of property was secured and a test well driven. The results of analyses of samples collected from this well showed it to be satisfactory from all standpoints, and accordingly it was recommended that the village install a new system but particularly to locate the wells as far apart as possible and never to pump them over the rate used on the test well. These recommendations were fully carried out only after considerable time and patience had been expended to convince the village authorities.

In the two years in which the county has had a sanitary engineer, 4 new sources of water supply have been approved and the sources of pollution have been entirely removed from 3 supplies which had been threatened with potential pollution for many years.

SEWERAGE AND SEWAGE DISPOSAL

The satisfactory disposal of sewage on a broad scale in the communities in

Suffolk County, particularly in the western part, is the big sanitary problem and the most difficult one to solve properly. When numerous complaints are received from nuisances caused by insanitary conditions due to overflowing cesspools or the discharge of raw sewage into creeks and bays, it is the duty of the county sanitary engineer to agitate and stimulate the construction of a proper sanitary sewer system and disposal plant. Where the State Health Department has already made a sanitary survey recommending sewers, he endeavors to have these sewers installed by developing a plan and a tentative estimate of cost. The difficulty of promoting sewer systems on Long Island, particularly in Suffolk County, is manifold for the following reasons:

1. The comparative ease of disposal of sewage into the generally prevalent sandy and gravelly soil by means of individual plants on small lots makes the great bulk of the population not in favor of them.

2. The flatness of the land and the high level of the ground water, especially on the south side of the island, makes the construction of sewers expensive.

3. The necessity for the protection of shell-fish bearing areas and bathing beaches, which are usually in shallow and not well circulated waters, makes the cost of treatment high.

4. The lack of incorporation of practically all the large villages makes the legal method difficult.

5. The rapid growth of the communities in the western part of the county and the consequent expenditure of public money for other necessary improvements make the growing communities reluctant to spend a large amount of money from which only the business and comparatively small built-up areas will receive especial benefit at that time.

The above reasons explain partly the fact that out of the 48 communities above mentioned, only 7 have sewer systems and 1 of the 7 has an adequate and comprehensive sewer system and disposal plant. However, 1 community is now constructing a system and another has been ordered by the State Health Department to construct one.

The county sanitary engineer has completed thorough reports on proposed sewer systems and disposal plants for 2 communities. With the publication of these reports, he will endeavor to seek their adoption and completion by continual personal work with the local committees, organizations and authorities.

The supervision of operation of existing sewage treatment plants is a very important duty of the county sanitary engineer because only 1 of the 7 plants above mentioned has a full-time, trained operator. The operators of the other 6 plants are only part-time and have varied occupations. They had to be convinced of the necessity for the regular report on operation which could be submitted to the State Department. It is almost physically impossible in 3 of these plants to make the regular orthotolodine residual test so the chlorine rate in these plants is fixed according to the maximum flow of sewage. However, all these plants excepting 1 make regular reports to the state and maintain fairly constant chlorine control.

There are numerous places, particularly in the western part of the county, where sewers are needed and it is to be hoped that a broad and comprehensive plan on an economical and logical basis can be worked out and established. With its establishment, it will be the duty of the county sanitary engineer to see that all the installations of sewers and sewage treatment plants are developed and installed according to that plan.

GARBAGE AND REFUSE DISPOSAL

The supervision of garbage and refuse disposal rests to some extent in the Board of Health. Garbage and other organic matter in the process of decay cause disagreeable odors and breed flies and rats. Also, such material is liable to catch fire and sometimes does, which produces smoke which has an obnoxious

odor. The indiscriminate dumping of garbage, together with the presence of many public dumps, causes nuisances detrimental to the health of considerable numbers of people in the vicinity of the congested and built-up areas.

The local health department receives many complaints concerning this improper garbage disposal. Where numerous complaints are received in one vicinity, the county sanitary engineer makes a thorough investigation noting the location of dumps and dumping areas and their proximity to houses and built-up sections and the existing facilities in that area for the collection and disposal of garbage and refuse. He then recommends the most logical, economical and sanitary method for collection and disposal. Investigations have already been made concerning the garbage and refuse situation affecting about one-half the people in the county and certain definite results accomplished.

The proper method for each locality differs, but the main point is at first to recommend a place and method of disposal and then build up the collection systems around this focal point. According to present-day practice, the most sanitary and economical method of destroying garbage and refuse is by means of a properly designed and operated incinerating plant.

Because of the conflicting political subdivisions on Long Island it was necessary (in the four chief investigations made by the County Health Department) to recommend different operating procedures to accomplish efficient waste collection and disposal. In one case the *township* was advised to establish an incinerator, in another, a combined incinerator and garbage collection *district* was formed, and in the other two cases, the construction of incinerators was recommended to the incorporated *villages*.

With the providing of incinerators in areas in the county, the towns and vil-

lages are prevailed upon to pass strict ordinances making it criminal to deposit any refuse and garbage in any places other than those provided, and in this way it is to be hoped that the county will be rid of this nuisance producing garbage and refuse dumping.

The County Health Department has already accomplished very definite results in the four chief investigations made. Two places have already spent \$110,000, another town has engaged an engineer and will spend about \$60,000, and in the fourth, the erection of a suitable incinerating plant is being favorably agitated by the inhabitants. In still other areas, the department will help to stimulate further action in order to provide as soon as possible the proper central incinerating plants for the disposal of all garbage and refuse.

NUISANCES

The investigation and abatement of nuisances is a function of the local health department and one that unfortunately at times consumes a considerable amount of the time of the engineer and the officials of the department. In Suffolk County, all complaints regarding alleged nuisances made to the Health Department are immediately investigated, largely by the county sanitary engineer.

The existence of a nuisance detrimental to health is largely a question of fact and it devolves upon the one who investigates it to decide whether a health nuisance exists or not. Many complainants are satisfied with a personal visit of an investigator because a large number of complaints are only disputes and do not come under the jurisdiction of the Health Department.

Where the department receives numerous complaints from one community relative to improper garbage or sewage disposal, the procedure is usually as mentioned above, that is, a thorough investigation of the whole

community's needs is made along these lines. Where isolated cases of these two conditions or similar conditions which might affect health are found, the engineer visits the place and in practically all cases secures voluntary compliance without recourse to legal action. In this way, a great number of major health nuisances, some of which have long existed, have been cleaned up by the County Health Department. In the second year of this department, 74 nuisances and complaints were investigated, 63 of which were entirely abated.

STREAM POLLUTION

The elimination and prevention of stream pollution is a subject which has recently engaged the attention of the Health Department in one particular instance. In this case, the river is a tidal stream, and it was a large shell-fish bearing area. A year ago this area was condemned by the Bureau of Marine Fisheries for the taking of shell-fish because of high bacterial counts and the apparent presence of human contamination. At the request of the town board of the town in which this river is located, a survey was made by the county sanitary engineer. The result of the survey showed the chief points of pollution to be near the head of the river where there were a group of houses, restaurants, and a hotel, and near the mouth of the river where there was a large state institution having an overloaded sewage plant and a large storm drain, the contents of which showed heavy pollution.

The County Health Department secured the voluntary elimination of the sources of pollution from the storm drain and also was able, by letter of recommendation, to have a new chlorinator installed at the sewage plant and the old one placed in proper operating condition. It was able, through the same procedure, to have the residents along the river remove their sources of

pollution and install proper sanitary disposal plants at a sufficient distance from the river. A thorough re-survey of this stream has been recently made by the department and it was found that the results of bacterial analyses had decidedly improved.

MILK SANITATION

The supervision of installation and operation of milk pasteurizing plants is placed under the direction of the sanitary engineer. In Suffolk County there are 2 dairy and milk inspectors whose function it is to supervise the dairies, of which there are between 200 and 300 producing milk sold in this county. The number of pasteurizing plants has been doubled in the county in the last 3 years so that there are now 12. Continual checking up on the recommendations made by the State Health Department concerning these plants resulted in the final approval of the plants existing at the time of the formation of the County Health Department.

The installation of the new plants was carefully watched by the county sanitary engineer in order that they would entirely fulfil the 75 provisions of the *State Sanitary Code* relating to construction, apparatus and sanitation because it is felt that the placing of a pasteurized milk cap on a bottle means to the milkman an insurance and to the public assurance that the milk contained therein is especially safe and a definite safeguard against the transference of any disease.

CAMPS

The County Health Department through its engineer enforces the provisions of the *State Sanitary Code* relating to camps, including the supervision of water supplies, milk supplies, disposal of garbage and sewage, and elimination of insects, particularly flies, and the issuing of the annual permit. In a survey made last summer there

were found about 50 camps in the county many of which had never been inspected before the formation of the County Health Department.

The installation of an adequate water supply under pressure and a water-carriage sewer system with a small sewage treatment plant has greatly helped in the prevention of water-borne diseases and in making the camp a healthful place. The chief difficulty found in sanitation is the proper collection and disposal of garbage and kitchen wastes with a consequent fly problem. The best way to prevent flies, it was explained to the camp directors, was not to allow the exposure of any garbage or other organic matter; in other words, all garbage should immediately be put into properly covered metal cans.

Various methods of disposal of garbage were in use. Some camps had it removed by farmers; some tried burning it; others had it buried; while others were so situated that the garbage was removed by a public collection system, which method is, of course, the best. With the exception of the latter method, burying under at least 6 inches of dirt each day seemed to be the simplest and best method and it was recommended in most places. Keeping the kitchen and its surroundings clean and free of any exposed organic matter was found to be the most satisfactory method of preventing or eliminating flies.

Of the 50 camps, only 33 were given permits last year and some of these only after repeated visits to clean up certain insanitary conditions. It was estimated that about 12,000 people were in the camps in Suffolk County during the summer of 1930.

SWIMMING POOLS

The *State Sanitary Code* prescribes regulations for the construction and operation of artificial and partly artificial swimming pools which regulations are to be enforced by the local health de-

partment. A survey made last year by the county sanitary engineer indicated that such pools in Suffolk County were open to the air and operated only during the summer months. Only 6 pools were found, all located on the south shore, adjacent to public bathing places and operated on the draw and fill method.

These pools were carefully inspected, visits being made on hot Sundays when the bathing was at its maximum peak. As no purification or disinfection process was being used, particular emphasis was laid on the bacterial quality of the water. The sources of supply of the water were carefully examined, and all except one were found to be satisfactory. The results of analyses of samples collected from the pools, with the exception of the last mentioned, showed a bacterial quality above the standard re-

quired by the *Code*. This last pool was slightly below the standard, due undoubtedly to the somewhat unsatisfactory source of the water. A special effort will be made before this pool opens this year to have the quality of the water improved either by disinfection or changing the source to wells or some other satisfactory method. A special permit or license is required for the operation of these pools.

In concluding this subject, it might be added that the particular problems mentioned would be somewhat different in other counties, but it is the duty of the county sanitary engineer, trained in the broad principles of sanitation laid down by the State Health Department, to apply these principles toward the solving of the particular problems in his jurisdiction.

DISCUSSION

JAMES L. BARRON

*Director, Division of Sanitation, Westchester County Department
of Health, White Plains, N. Y.*

MR. COOK'S paper presents an excellent review of the manifold functions of the sanitary engineer in a county health department. Through the engineer, and the inspectors working under his direction, many important contacts are made and services rendered to the individuals composing the population of the health district. Engineers of a state health department deal largely with municipalities and confine their activities primarily to the major problems of the water supply and the disposal of wastes. The county sanitary engineer has intimate contact with the officials of the municipalities or other governmental units within his territory and in addition renders service to smaller groups, organizations, institutions, and individ-

ual householders in numerous matters.

The sanitary engineer finds frequent opportunity to act as mediator and arbitrator between local municipalities or areas, and between various departments of the local government, where jealousies and suspicious attitudes or misunderstandings must be reconciled in order to promote a public good. There are many occasions when the differences of communities or groups of individuals with regard to matters of sanitation or conditions of environment need sympathetic and rational handling by the engineer. Such differences frequently arise over the disposition of garbage and the discharge of sewage.

Supervision of milk supplies can only be effective when all of its details are

centralized at one office. Adequate records of all sources and channels of delivery must be maintained. Inspections of dairies, shipping stations, pasteurizing and bottling plants, must be coordinated with the collection of samples and the interpretation and use of the results in the enforcement of the milk code. This work is a most important function of the sanitary engineer and it may well include the direction of a campaign for the eradication of bovine tuberculosis within the health district.

The New York *State Sanitary Code* imposes upon health officers the responsibility of issuing permits for the construction and operation of swimming pools. This is essentially an engineering job and in Westchester County where there are over 40 pools under the supervision of the County Health Department, valuable service has been rendered to the pool owners and operators in showing them how to run filters, apply chemicals, and make operating tests. In Westchester County it has been found necessary to require reports of daily operation on all swimming pools and these reports serve as the basis of the Health Officer's assurance that such pools are safe to use.

The multitude of complaints of nuisances, actual and alleged, which come to a county health department give the sanitary engineer many opportunities to exercise engineering judgment and to assist individuals in the solution of sani-

tary problems where the services of an engineer would not otherwise be obtainable. To the average householder a polluted well or a faulty private sewage disposal system presents a difficult problem, which, however, may in many cases be corrected by following recommendations of the sanitary engineer.

The health department is, in many cases, believed to have extraordinary police authority and to be capable of dealing with conditions which have no relation to public health. It has been found advisable in Westchester County to adopt a sanitary code, prepared by the engineer, which supplements the *State Sanitary Code* in many matters relating to general sanitation, foods, milk, and swimming pools. This code establishes penalties for violations, and serves to define the matters with which the health authority may deal. Experience thus far indicates that such a code is an invaluable instrument in the effective functioning of the sanitary engineer and his inspectors.

Sanitary engineering service is one of the most important to be rendered by a county health department. Obviously such service, together with many others from such a department, can be obtained only when health units are organized on the basis of a large population and taxable wealth sufficient to support trained personnel capable of administering the many phases of modern public health work.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., PH. D., AND LEONARD GREENBURG,
M. D., PH. D.

Eugene Lyman Fisk—The sudden death of a pioneer organizer of the Section on Industrial Hygiene in the Association has taken place. Dr. Eugene Lyman Fisk was one of the group at the Jacksonville Meeting in 1914 which formed the Section, and always took an active part in its work, having held all of the offices in the Section, and was Chairman at the Chicago Meeting in 1928.

A man, small in stature, quick in action and response, he will always be remembered for his business-like demeanor at our proceedings, his mental acuity and sly sense of humor, and innate good fellowship. We recall, at the height of a warm discussion before the Section at the Chicago Meeting, Dr. Fisk's apt question, "Gentlemen, are you discussing a condition of fact or a state of mind?" Similarly, all will recall his firm position on fundamentals, his spirit of congeniality and great fairness, and his labors with our various committees in which he spared neither time nor expense, while the finish he gave his reports was classical.

He was visiting his daughter who lives in Paris and had gone to Dresden to view the exhibit which the Life Extension Institute had loaned to the famous Hygienic Museum in that city when he was suddenly stricken, July 5. He was in his 65th year. As the world's great pioneer advocate of periodic medical examinations and their effectiveness in prolonging health and life, he unfortunately, as is so often the case with a pioneer leader, passed too soon out of the picture. Yet Professor Irving

Fisher comments that Dr. Fisk had lived longer than most of his family,



EUGENE LYMAN FISK, M.D.

which was a short-lived one, and attributes the real cause of his death to grief over the death of his wife.

One of the last pieces of work Dr. Fisk did while he was in France was the preparation in his own handwriting of the draft of his report as Chairman of our Committee on Industrial Fatigue, which he had hoped to work over and present in person at the Montreal Meeting in September. He was feeling quite himself when he made the trip from Paris to Dresden, so writes his secretary.

None need to be reminded that Dr. Fisk was the author, with Professor Irving Fisher, of the famous textbook, *How To Live*, 18 editions and numerous reprintings of which have appeared since 1915, or shortly after Dr. Fisk became the energetic Medical Director of the Life Extension Institute, in which the Hon. William Howard Taft was intimately interested and permitted his name to be used as Honorary President. The motif of this work is found in the following, which mottoes the 18th edition:

"Self love, my liege, is not so vile a sin, as self-neglecting.—*King Henry V, Act 2, Scene 4.*"

More closely bound up with the activities of our Association are to be mentioned his work on "Health Building and Life Extension," while his work in connection with the Council on National Defense laid the foundation for his books *Alcohol: Its Relation to Human Efficiency and Longevity*, and *Health for the Soldier and Sailor* (with Prof. Fisher), to which is to be added *Food: Fuel for the Human Engine*. To the medical world, particularly insurance examiners, his work with Dr. J. Ramser Crawford, *How to Make the Periodic Health Examination*, is the acknowledged leader in its field.

Naturally Dr. Fisk was a member of numerous scientific, professional and social-economic organizations. He began his life's work after graduation as an honor student from the University of New York in 1888, and after a few years in private practice went with the Equitable Life Assurance Society. He was appointed Medical Director of the Provident Savings Life Assurance Society in 1898. Here he organized the first periodic health examinations and education services established by any life insurance company. His publications show, likewise, that he took a keen and intensive scientific interest in the data secured from nearly a million phys-

ical examinations conducted by the Life Extension Institute. He developed the sinister significance of "silent sickness" in marring life and its span, and hence the stress on periodical physical examinations, especially for those in mid-life and beyond.

He is survived by two daughters and three grandchildren. Brief funeral services held in Dresden were attended by the American Consul General and many officials and physicians, while burial services were completed in Brooklyn, July 30. Among the honorary pall bearers were a considerable number of members of the American Public Health Association.

It seems hardly fit to close without emphasizing Dr. Fisk's point of view on industrial fatigue, namely, continuous research along physiological and psychophysiological lines, with far more stress on intrinsic or bodily causes than extrinsic or environmental causes, and the reader will be well repaid in reviewing the last report of his committee in the Association's *Yearbook, 1930-1931*. The August issue of *How To Live* is devoted to press comments on Dr. Fisk's life and achievements.

Report of the Division of Occupational Diseases, Connecticut State Department of Health, 1930—With an appropriation of \$27,002.25 for the 1929-1931 biennium, the Division of Occupational Diseases, composed of a director, an industrial hygienist, and a secretary, made 81 surveys and 25 studies of industrial conditions during the year 1930, and compiled data on 485 cases of occupational diseases reported. The state has an estimated population for July 1, 1929, of 1,641,313, and is divided into 8 counties, some of which are busy industrial centers.

It was also found that about 200 cases of occupational diseases which were reported for compensation, according to the files in the Superior Courts,

had not been reported to the division. Each of these had lost at least a week's time, from which it can be judged that there were many more cases than those reported. A slight modification of the so-called "standard report form" for occupational diseases is required to be filled out by physicians having knowledge of such cases.

The technical part of the work was organized as follows: (1) Survey of industries where potential occupational disease exposures exist and studies in plants presenting actual hazards; (2) making surveys requested by industry and studies where necessary; and (3) working out, in laboratory, technical details for particular studies.

To facilitate this program, a classification or codification of Connecticut's industries was effected, dividing them into about 100 groups. Likewise, potential hazards have been codified, there being about 70 of these (copies of forms, and tables are presented).

The division made 278 field trips and 145 visits to industries in addition to surveys and studies above enumerated, and during the year 33 towns in the state were visited.

The surveys included such matters as general hygienic conditions, spray coating, sandblasting, chromium plating, buffing and polishing, benzol poisoning, carbon disulphide, occupational dermatitis, radium, sulphur dioxide, vitreous enamel spray and hydrogen sulphide. Certain educational activities were likewise carried on and a number of prominent persons visited the division during the course of the year.

It is felt that the work of the division has now grown to such an extent that more assistance is necessary even to meet the request for studies and surveys coming from industrial sources.—Albert S. Gray, Chief, Division of Occupational Diseases. *Report of the Connecticut State Department of Health*, 1930, pp. 249–277. E. R. H.

Benzene (Benzol) Poisoning—

This is an attempt to summarize what was published to December, 1930, regarding the action of coal tar benzene, C_6H_6 , on animals and on human beings. The effect of large doses resulting in acute poisoning can be considered fairly briefly; the more important action of small doses administered over long periods of time has been far more extensively studied, and here there are many records of experiments on animals and also of the experimental use of benzene in the treatment for leukemia. There are also a fair number of careful clinical histories of chronic benzene poisoning, always in industrial workers, and a small number of detailed reports of autopsies.

Under chronic benzene poisoning the discussion pertains especially to experimental poisoning in animals, a short review of experimental poisoning in man, and a considerable discussion of clinical observations and case reports, including recovery, and the influence on infections.

The pathologic anatomy with differentiations from other diseases of the blood and the findings of most recent investigators are all included. (The bibliography fills 5 complete pages.)—Alice Hamilton, *Arch. Path. & Lab. Med.*, 11: 434–454; 601–637 (Mar. and Apr.), 1931. E. R. H.

Board for Silicosis and Asbestosis

—A general medical scheme has been arranged by the British Government for coördinating the regulations for examination and certification under the different workmen's compensation schemes for silicosis and asbestosis. A medical board will act for the whole country and will be responsible for all the examinations and certificates required. Four local panels have been set up in the industrial areas concerned—at Newcastle-on-Tyne, Bristol, and Stoke-on-Trent.

A scheme has been arranged for the

asbestos industry and extended to the various industries in which silicosis occurs by which workmen who, though not totally disabled, are certified to be suffering from silicosis, to make it dangerous for them to continue in the processes; they shall be compensated.—London Letter, *J. A. M. A.*, 27, 2: 113 (July 11), 1931. E. R. H.

Colliers and Silicosis—Prof. S. Lyle Cummins (Cardiff), speaking on coal miners and tuberculosis, said that coal miners, although so constantly exposed to the inhalation of both coal dust and stone dust, are notoriously less liable to pulmonary tuberculosis than the rest of the adult male population in Great Britain. There is, however, a high death rate of colliers from bronchitis.

A large proportion of elderly coal miners are affected with a degree of silicosis which though not sufficient to prevent them from working is sufficiently advanced to give rise to the radiological appearances characteristic of lung fibrosis; such men tend to be short of breath on exertion and are liable to have a cough and bring up rather copious sputum, often black in color; they are also subject to fairly frequent attacks of catarrh.—Annual Congress at Frankfort-on-Main, Royal Institute of Public Health, *Lancet*, 5625: 1367 (June 20), 1931.

E. R. H.

Silicosis in Ohio Industries—Sixty cases of silicosis from 26 localities were presented in this study, half of them with photographs of X-ray films, presented or loaned to the author by hospitals, radiologists, and physicians in certain centers. Thus, in all cases the victims were seeking medical aid, usually for shortness of breath, general fatigue, etc. Many of the cases were first diagnosed as to tuberculosis, chronic bronchitis, asthma, etc., but the history of the occupation coupled with radio-

graphic findings rendered diagnoses of silicosis possible in all cases included in the study.

These cases represent 15 industries. Twenty-four of the 60 cases were sand-blasters, 22 of which averaged 45 years of age and 7.7 years of occupational exposure (in 2 cases these data were not supplied). This was the shortest occupational life period in the group. Seven were granite and marble cutters averaging 53 years of age and 26 years of occupational exposure. Six were metal grinders and polishers averaging 55 years of age and 20 years of occupational exposure. Six were pottery and porcelain workers averaging 51 years of age and 28 years of exposure—the longest occupational life period. Autopsy findings substantiated the diagnosis in 4 cases. Tuberculosis was found to be a common complicating disease in these cases of silicosis, being present in 23 out of the 60 cases.

Full-page, half-tone photographs of X-ray chest films are presented with the thesis, the first one of which is that of a normal chest in a blacksmith in a stone quarry, 53 years of age, used for contrasting the other photographs shown.—B. E. Neiswander, Thesis for the M.Sc. degree, Ohio State Univ., 94 pp., 31 plates; also tables (June), 1931.

E. R. H.

Comparative Cost of Maintaining Health Departments in Michigan Industrial, Public Utility and Mercantile Establishments—

Number of Employees	Cost per Employee
20,000 to 25,000	\$7.28 per year
10,000 to 19,000	6.87 " "
5,000 to 9,000	5.78 " "
2,500 to 4,500	5.20 " "
1,000 to 2,400	7.37 " "
500 to 900	6.29 " "
200 to 485	8.93 " "
Average cost for each employee	6.95 " "

Less than one-third of the establishments surveyed could give reliable fig-

ures on the cost of maintaining the health departments in their plants. Many did not keep accurate account of certain items, but all declared: "The well organized health department is worth while at any cost."

The cost of the health service through the plant first aid or health departments, as reported by individual firms, ranged from \$2.47 to \$22.00 per employee per year. The plant in which the cost was \$22.00 per employee averages 1,900 employees; has full-time medical service by employing 2 physicians, each serving $\frac{1}{2}$ day in the plant; has 3 nurses in the plant and 1 full-time visiting nurse; a fully equipped industrial hospital—eye room, dental room, X-ray and physical therapy rooms; requires careful physical examinations of all new employees and periodic health examinations. This plant has discovered a number of active cases of tuberculosis and taken steps to have all of them hospitalized. It reports also that in 2 years' time the average lost time by illness has been reduced from 8 to 3.4 days per employee, and no days lost from infections.

Another firm with 3,500 employees, 1 part-time physician and 4 nurses in the plant, stated that absences from illness have been reduced 49 per cent during the last 2 years, since establishing their visiting nurse service, to which they credit much of this improvement.

Ten per cent of the plants included in this report have 1 or more physicians engaged for full-time; 40 per cent have 1 or more physicians on the part-time plan—1 to 4 hours in the plants; while 50 per cent have physicians engaged "on call" only, most of them on the "service fee" basis.

Of the plants with 10,000 to 25,000 employees, 100 per cent have full-time physicians and 2 to 6 nurses in the

plants; 50 per cent have visiting nurses.

Of those with 1,000 to 9,000 employees, 36 per cent have certain physicians on call; $30\frac{2}{3}$ per cent have part-time physicians and $33\frac{1}{3}$ per cent have full-time physicians. These plants have from 1 to 5 nurses in the plants and 26 per cent have visiting nurses.

Of the plants with 200 to 900 employees, 80 per cent have physicians on call, and 20 per cent have part-time physicians, no full-time physicians; 60 per cent have 1 nurse each in plant and 40 per cent depend on first aid workers.

In the plants having from 200 to 485 employees wherein there are the least adequate provisions for health service, the cost is highest.—Frank A. Poole, Director, Bureau of Industrial Hygiene, Michigan Department of Health, 1 page mimeographed (July), 1931.

E. R. H.

The Measurement of Physiological Values in Industry—A standard for nomenclature for classifying industrial employees physically and the technic of charting functional capacity are principal features of the paper. The psychological technic involves the interviewer, precautionary "don'ts," the conduct and scope of the medical examination, and standardization.

The physical technic concerns the type of instruments needed and a classification of the defects found—five classes being recommended.

A physician's key for correct technic in measuring and classifying functional capacity constitutes the major portion of the paper, which is accompanied by an infolded sample chart arranged for 16 physical examinations on the same individual. The chart is suggested as a standard form for adoption in industrial medical services.—M. E. Fulk, *J. Aviation Med.*, 1, 4; 237–294 (Dec.), 1930.

E. R. H.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Studies on the Effects of Overdosage of Vitamin D. II.—Experiments have been conducted showing that extreme overdosages of vitamin D had a peculiar action on the mineral metabolism of white rats and that increasing the dosages beyond a certain minimum caused a decrease in the ash of the long bones of the rat (*J. Biol. Chem.*, 84: 487, 1929; 86: 245, 1930).

The animals used in the experiment reported here were classed in 4 groups: Group I consisted of 9 third and fourth generations of young rats whose progenitors had received 40 units of vitamin D daily. These animals were placed on the same basal ration with the addition of 6,000 units of vitamin D in the form of dry irradiated ergosterol crystals. At the end of 3 weeks the animals were killed and autopsied and the specific organs and bones analyzed for ash content. Group II consisted of 6 adult second and third generation animals from the lot receiving 40 units of vitamin D daily. Group III consisted of third and fourth generation young animals whose progenitors had received 2,500 units of vitamin D daily. Most of the animals in this group died from the toxic effects of overdosage. Group IV consisted of 8 normal young animals to each of which were administered 10,000 units of vitamin D daily for 2 weeks. A table is given showing the analyses of bones and organs from all groups.

Dosages of 40 units of vitamin D daily were found to have no effect on the mineral metabolism of white rats when continued through the third and the fourth generations. No pathological calcification occurred and the ash of

the bones was normal. The animals which received a moderate overdosage of vitamin D for a long period of time were more susceptible to a massive overdosage than normal animals.

A large overdosage (2,500 units) of vitamin D just insufficient to produce toxic symptoms in the first and second generations, given for a long period of time, produces the following changes in the third and fourth generations: (1) decalcification of the bones, (2) severe calcification of the bones, (3) severe calcification of the kidneys, and (4) certain pellagra-like symptoms, namely scabby conditions of the feet, nose, and forequarters.—Robert F. Light, Glenard E. Miller and Charles N. Frey, *J. Biol. Chem.*, 92: 47 (June), 1931.

Fat Soluble Vitamins. XXXII. The Distribution of Vitamin A in Tomato and the Stability of Added Vitamin D—In this paper the literature on the vitamin content of tomato has been reviewed. The object of this experiment was to determine how small an amount of tomato would be required to furnish the rat with sufficient vitamin A. Seventy-five white and piebald rats, 3 weeks old and weighing 50 gm., were used. They were fed a vitamin A free basal ration consisting of alcohol-extracted and heated casein 18; salt No. 40, 4; agar 2; yeast 8; dextrin 68. The ration was supplied with vitamin D by treating with ultra-violet light from a Cooper Hewitt quartz mercury vapor lamp.

The animals were fed as much of the ration as they cared to consume. Symptoms of ophthalmia appeared at the 4th or 5th week, but occasionally at the 3d

or 4th week, after which decline in weight followed.

When the ophthalmia gave indication of being permanent the rats were taken for test. They were given small amounts of tomato preparation in addition to the basal ration. Charts are given showing the rate of cure of ophthalmia on whole tomato and on tomato serum.

Recovery from ophthalmia was very slow, when the whole tomato preparation was $\frac{1}{8}$ c.c. daily. On $\frac{1}{4}$ c.c. of tomato daily, ophthalmia was completely cured in 10 weeks and on $\frac{1}{2}$ c.c. by the 8th week. On 1 c.c. of the tomato serum the animals all died by the 5th week. On 2 c.c. one animal died during the 6th week. On 4 c.c. one animal died during the 4th week and the others improved very slowly but died in the 11th week. It will be observed that the whole tomato contained about 32 times as much vitamin as the serum.

Experiments were also made to determine vitamin D, and tables are given showing the calcifying action of tomato alone and of tomato and ergosterol. Vitamin D added in the form of irradiated ergosterol was found to maintain its activity after sterilization followed by 13 months' storage at 37° C.—H. Steenbock and Inez M. Schrader, in coöperation with Blanche M. Riising and Alice M. Wirick, *J. Nutrition*, 4: 267 (July), 1931.

The Effect of Desiccation upon the Nutritive Properties of Egg-White—In a paper by Boas (*Biochem. J.*, 21: 712, 1927), it was shown that dried egg-white, when used as the sole protein in a diet for young rats, produces symptoms such as dermatitis, baldness and spastic gait which terminated in death in from 4 to 6 weeks. It was further shown that these symptoms could be prevented if substances such as yeast, potato, arrow-root, and fresh egg-white are added to the diet. Two

hypotheses were advanced as possible causes: (a) that dried egg-white is lacking in some essential dietary factor, which is supplied by protective factor X; and (b) that a toxic substance is formed in dried egg-white as a result of desiccation, and that this is neutralized in some way by protective factor X.

This paper is concerned chiefly with a series of tests, some of a curative and some of a preventive nature, in which the effects of using some of the different constituents of egg-white, fresh or dried, as the source of protein were investigated. A table gives details as to the different diets used. All egg-white diets were dissolved in water and coagulated by heat before incorporation in the diet.

Each rat received with the diet 3 to 5 drops of cod liver oil daily. Crystalline ovalbumin was used as the sole source of protein in the diets of 2 rats which developed the usual symptoms after receiving dried egg-white diet for 8 weeks. Their condition improved and rapid growth followed. From the results here obtained it appears that when egg-white is dried some toxic substance is formed.

According to Hektoen and Cole (*J. Infect. Dis.*, 42: 1, 1928), there are five different proteins in egg-white—ovoglobulin, conalbumin, ovalbumin, ovomucin, and ovomucoid. Each of these was examined separately in an effort to determine from which protein the toxic substance is derived. The results obtained indicated that neither of these products contains toxic substances. It is concluded, therefore, that during desiccation of egg-white a toxic substance is formed from some non-protein constituent and that this substance remains present in the mother-liquor after removal of the proteins by precipitation with ammonium sulphate. However, the experiment has not yet been carried out to establish this belief.

It was found that rats suffering from the effects of the dried egg-white can

become spontaneously refected and that this condition can be transmitted from one rat to another by ingestion of the feces. Refection can be induced in rats, receiving the dried egg-white diet, by feeding the bulky white feces of refected rats on diets deprived of B vitamins. This suggests that the agency is the same in both cases.—Margaret Averil Boas Fixsen, *Biochem. J.*, 25: 596, 1931.

The Effect of Pasteurization upon the Vitamin C Content of Milk in the Presence of Certain Metals—This paper reports the results of studies as to the effect on the vitamin C content in pasteurized fresh milk aerobically in aluminum, in tinned copper, and in copper tubular pasteurizers. Six groups of animals were used, as follows: (a) a negative control group received no supplementary milk, (b) an autopsy control group was fed spinach as a source of vitamin C, (c) a standard comparison group received graded doses of raw milk, (d), (e), (f) three groups received graded doses of milk pasteurized respectively in aluminum, tinned copper, and copper.

Young male guinea pigs, weighing 200 to 240 gm., were placed on a basal ration with 35 gm. of fresh spinach and 10 to 30 c.c. of fresh, whole milk daily. The tables showing results of the experiments with the different dosages of raw milk indicate that 35 c.c. of the raw milk were not sufficient to protect the animals from scurvy and that there was about a 20 per cent deterioration in the

quality of the milk as the season advanced.

The effect of pasteurizing milk in tinned copper was slightly greater than that found with the aluminum, the effect being noticeable both during the progress of the experiment and upon post-mortem examination of the animals.

The pasteurization of milk in naked copper resulted in a destruction of at least 80 to 90 per cent of the anti-scorbutic vitamin, but all of this percentage cannot be charged to copper since the exposure to copper and the aerobic pasteurizing process both tend to destroy the vitamin.

The practical importance of these experiments is that copper is again shown to be unsuited for construction of dairy equipment so far as conservation of vitamin C is concerned. Tinned copper is unsatisfactory because of the impracticability of replacing worn inaccessible parts of equipment. As regards the destruction of vitamin C, aluminum is as satisfactory a material as there is for dairy equipment. These experiments are not inconsistent with the theory that anaerobic pasteurization would reduce the vitamin destruction even in the case of copper.

The authors point out that even though the vitamin destruction were reduced, from a public health standpoint great care should be taken in securing construction material with the greatest negative potentialities.—E. W. Schwartz, F. J. Murphy, and Gerald J. Cox, *J. Nutrition*, 4: 211 (July), 1931.

CHILD HYGIENE

RICHARD A. BOLT, M. D., DR. P. H.

HEART DISEASE IN CHILDHOOD

THE prevention of heart disease in childhood continues to challenge our best efforts. Since the epoch-making work of Sir James MacKenzie we have gained a clearer conception of heart disease, especially as it shows itself in the early stages. Great improvement has taken place in the classification and diagnosis of heart disease due largely to the painstaking studies of the American Heart Association and the Heart Committee of the New York Tuberculosis and Health Association.¹ While our methods of diagnosis have become more refined and exact, our knowledge of the underlying causes of heart disease and its prevention has lagged.

It is true that now we possess a better view of the heart as a functioning organ and of its ability to adjust itself to varying loads. The recognition of the protean character of heart disease was a decided step forward in view of its changing character at different age levels. It is generally accepted that rheumatic fever with its accompanying conditions is the main etiological factor in heart disease of childhood. While there is still some question as to the relation between focal infection and rheumatic fever, Coombs² considers rheumatic fever as an infection by "microorganisms that do not seem to be radically different from the streptococci that inhabit the normal mouth . . . the soil is as important as the seed. The healthy child does not become rheumatic because of bacterial visitation but because of defects of inheritance and environment."³

There is a tendency to accentuate the darker side of heart disease as seen in adults and to overlook the possibilities of prevention in childhood. The usual somber picture of heart disease presented in current literature is that of a disease with rapidly increasing death rate about which we apparently can do very little if anything. This viewpoint arises largely because we have set before us the crude death rates from heart disease with little or no analysis as to age distribution.

It is certainly true that the crude mortality rate for heart disease has been increasing, but when this is carefully studied it is seen that the increase has taken place mainly after 40 years of age. Analysis of the death rates under this age reveals that there has been a decided decline at all age levels, especially under 10 years of age. In view of the fact that our methods of diagnosis have become more refined and that parents generally are having their children examined periodically by competent physicians one must consider the decline in heart death rates at the lower ages as quite significant. It simply means that we are saving more and more children to live up to the period when heart disease takes its largest toll.

It is not the death rates alone which should concern us. There is evidence to show that the diseases leading to heart disease are slowly coming under the control of preventive medicine. The prevalence of those diseases associated with heart disease in childhood has diminished during recent years. Rheumatic fever, long looked upon as

the greatest cause of heart disease in children, is apparently on the decline in many parts of this country. While there is still some debate as to the etiology of rheumatic fever itself, there is practically unanimity that it is a general infection attacking those with a "rheumatic constitution." At any rate it manifests itself in various ways depending upon the tissues attacked.

We have long regarded chorea, "growing pains," polyarthritis, tonsillitis, and pharyngitis as rheumatic manifestations which may be precursors of organic heart disease. These conditions in children are undoubtedly becoming less prevalent in many localities. We should also remember that other acute infections such as diphtheria and scarlet fever are either being reduced considerably or now appear in milder types. If focal infections in teeth, tonsils, sinuses, etc., have any bearing upon heart disease, as many believe, it must be recognized that these conditions in children are receiving more rational and thorough treatment than ever before.

Another fact which stands out prominently is that with increasing care in the examination of larger and larger numbers of infants, preschool and school children, there appears to be no increase in the percentage exhibiting organic heart disease. It is true, of course, that congenital anomalies of the heart continue to occur in about the same proportion as formerly, but these form such a small percentage of the total that we can practically leave them out of consideration.

When we come to consider children under 2 years of age who have not been hampered with congenital heart disease, we find that very few of them present any serious heart trouble. Careful examination of a large number of young children in our infant welfare centers reveals comparatively few with organic heart disease. Aside from those with

congenital deformities of the heart the death rate from heart disease under 5 years of age is relatively low.

When we consider the children of school age we find quite a diversity of figures presented. It is extremely difficult, if not impossible, to obtain comparable figures from different school reports. This is easily understood when we take into consideration the marked differences in methods of examination and reporting of heart disease. The figures range from 0.5 per cent to 1.5 per cent of the school children examined as having some form of heart disorder. The organic forms of the disease are not clearly differentiated from the functional in many of the statistics. Where painstaking examinations are made the percentage of organic lesions range from 0.3 per cent to 0.5 per cent in the elementary schools. There apparently is a very slight increase in the secondary schools. In children applying for work permits from 1 to 2 per cent show some heart defect, with about one-half of an organic nature.

From the data available one must draw the conclusion that while heart disease is a potential danger during the school age, it is by no means as serious as we have formerly been led to believe. We should especially be concerned, however, during the adolescent period as this is the time the heart is often put to considerable strain. Children returning to school after one of the infectious diseases should be carefully watched before being allowed to go into strenuous exercise.

Some very interesting data as to heart disease as a cause of death in children under 14 years of age appear in a recent contribution by Epstein.³ He reviews the results of 1,000 consecutive autopsies upon children. Of this number there were 68 cases of acquired heart disease of which 36 were in children with a definite history of rheumatism. The distribution of the lesions

found were as listed below:

Mitral valve alone	19
Mitral and aortic	12
Mitral and tricuspid	7
Mitral, tricuspid & aortic	5
Mitral, aortic & pulmonary	4
Mitral, pulmonary & tricuspid	2
All four valves	2
Tricuspid alone	2
Aortic alone	1
Pulmonary alone	1
Fibrous Adhesive Pericarditis	35
Purulent Adhesive Pericarditis	15
Serous Pericarditis	7
Fibrous Pericarditis without endocarditis	9

The question of the relation of tonsils and adenoids to the health of children has often been raised and discussed. Some years ago Kaiser published the results of the removal of tonsils and adenoids of children going to the Rochester Dental Infirmary. In certain respects his figures at that time were inclusive. He has recently published another paper of much wider scope based upon a control study of 4,400 children over a 10-year period.

This study suggests that certain infections have a close relationship to the presence or absence of tonsils and adenoids. Other infections are not influenced favorably or unfavorably by the presence or absence of lymphoid tissue. A few infections seem definitely more common in the absence of tonsils.

The removal of tonsils and adenoids influences favorably the incidence of the following infections: (1) colds in the head, (2) sore throats, (3) cervical adenitis, (4) otitis media, (5) rheumatic disease: The first attack of rheumatic fever and rheumatic heart disease occurred 33 per cent less commonly in tonsillectomized children. Chorea and recurrent attacks of rheumatic fever were not influenced by removal of the tonsils. (6) Diphtheria, (7) scarlet fever, (8) nephritis, (9) dental infections: such infections occurred only half as often in the children whose tonsils and adenoids had been removed.

The following infections were influenced favorably to a slight extent: (1) chorea, (2) measles, (3) laryngitis, (4) tuberculosis, (5) malnutrition.

The removal of the tonsils and adenoids influenced unfavorably the incidence of the following infections: (1) bronchitis, (2) pneumonia, and (3) sinusitis.⁴

Other studies are to be desired along this same line, especially as to the relation of removal of tonsils to rheumatic fever.

REFERENCES

1. *Criteria for the Classification and Diagnosis of Heart Disease*. New York Tuberculosis and Health Association, 1929.
2. Coombs, C. I. Diagnosis and Treatment of Rheumatic Heart Disease in its Early Stages, *Brit. M. J.*, 1: 227 (Feb. 8), 1930. Rev. in *Am. J. Dis. Child.*, 40: 168, 1930.
3. Epstein. *Am. J. Dis. Child.*, 41 (July), 1931.
4. Kaiser, Albert D. The Relation of Tonsils and Adenoids to Infections in Children, *Am. J. Dis. Child.*, 41: 568-581 (Mar.), 1931.

LESSONS FOR THE EXPECTANT MOTHER

IN 1922 Ellen D. Nicely, R.N., initiated an important piece of prenatal work in the University Public Health Nursing District of Cleveland, O. A course of plain talks and simple demonstrations was organized for mothers attending the newly established prenatal clinic of the Maternity Hospital of Western Reserve University. This proved of so much service to the expectant mothers and held out so much promise that Virginia Wing, secretary of the Health Education Committee of the Cleveland Health Council,

assisted Mrs. Nicely in setting up a number of prenatal institutes throughout the city where she could extend her instruction.

In 1926 a Prenatal Committee of the Cleveland Health Council sponsored this work and made possible a number of prenatal classes in different districts of Cleveland where expectant mothers could receive instructions with practical demonstrations. These classes were approved by the Academy of Medicine of Cleveland as they were acceptable to the foremost obstetricians in the city.

Mrs. Nicely then drew up a series of simple lesson outlines for use in her prenatal classes. To these she added further lessons in habit formation and mental hygiene prepared by Mrs. Gary Myers. These were reviewed and approved by a group of the leading obstetricians in Cleveland connected with obstetric services of hospitals of Cleveland. The lessons were printed in mimeograph form and were widely used throughout the city.

Three years ago the Cleveland Health Council recognizing the great value of this project and considering it important enough to be integrated with the maternity services carried on in the community, turned it over to the Maternity Hospital with its 8 prenatal centers, and at the same time made the service available to St. Luke's, Mt. Sinai, and Huron Road Hospitals. Since then

Mrs. Nicely has extended her group teaching, including in it lessons in mothercraft. Last year over 3,000 prospective mothers were reached. Of these mothers coming to confinement only one maternal death occurred. This certainly speaks eloquently for the value of such group instruction.

The lesson outlines have proved so helpful that it was decided to make them available in more permanent form to every organization in the community and to physicians and nurses who may care to use them. The Cleveland Child Health Association has had these outlines reprinted with attractive illustrations and is offering them for wider distribution. A copy of the *Lessons for the Expectant Mother* may be obtained upon request from the Cleveland Child Health Association, 621 Federal Reserve Bank Building, Cleveland, O.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

The Public Health Nurse and Cancer—Because the public health nurse comes in closer contact with more members of the family than perhaps any other individual she ranks high as an agent in cancer control. If she is "cancer conscious" she is able to uncover many early cases of this disease through her close contact with and observation of apparently trivial symptoms in her patients.

The public health nurse should have a considerable knowledge about cancer and how it should be handled, because cancer ranks second as the cause of death in the United States and she is

interested in health, also because most of the lay public have a particular dread of this disease.

The public health nurse is a trained observer. She can note the warty growth, the open sore or small ulcer, the scaly patch, the lump on the neck, the black or brown mole, all danger signals which need to be investigated and at least proved that they are not malignant.

As confidant of family abnormalities she also hears of symptoms which mean an early sign of cancer, like irregular uterine bleeding, blood in the urine, a lump on the breast, etc. Usually it is doubly hard to get patients with these symptoms to seek medical consultation because no pain is present. These symptoms may not mean cancer, but it

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

is the duty of the public health nurse to see that the patient receives an examination by a competent physician, to eliminate the possibility of cancer.

Many physicians are not qualified to determine whether or not a patient has cancer in its early stages, but by inquiring into the manner in which the examination was made (sometimes medicine is given without an examination) the nurse can get a pretty good idea of the reliability of the opinion given by the medical man. She knows something about the value of the cystoscope, the proctoscope, the laryngoscope, the speculum and digital examination. Sometimes if she feels that the opinion of one medical man has given the patient a false sense of security she should advise him not to be satisfied with one opinion in so important a matter.

Even after the patient has consulted a physician about some suspicious lesion, she must follow him up, see what the physician has advised and see that the patient follows this advice. She can explain why the physician wishes to take a section of the tumor or ulcer for examination, why the physician is the best judge of whether surgical methods should be used or not, and why the quack doctor can do untold harm in treating cancer. She can enlighten the patient somewhat on the use of electrical treatment and radium.

The nurse cannot recommend a physician even though she knows the patient cannot very well judge what physician is or is not qualified to give radium treatment; but she can "be prepared to offer a list of specialists competent to treat cancer, and inform herself on the clinic facilities available for those unable to go to private physicians."

The hope of curing cancer lies in early discovery, so the public health nurse is justified in taking special care to see that the cancer sufferer obtains correct treatment at the start of the disease. On her rests a grave responsi-

bility to increase her value through her knowledge of cancer, since she will often be the "first contact between the early cancer case and the path which leads to proper treatment."—Ellis Fischel, *The Public Health Nurse's Responsibility in Relation to Cancer*, *Pub. Health Nurs.*, XXIII, 7: 334-337 (July), 1931.

The Vassar Training Camp for Nurses Has a Lasting Memorial—On June 24, 1918, 435 young women, graduates of 115 colleges and universities from all over the United States, with a few from Canada, gathered on the campus at Vassar College. At the same time came a faculty of fifty or sixty which included such scientists as Florence R. Sabin, M.D., of Johns Hopkins, C.-E. A. Winslow of Yale, Otto K. O. Folin of Harvard, William H. Park, M.D., of the New York City Laboratories, Margaret E. Washburn of Vassar, and other teachers of science from various colleges and medical schools. There were also instructors from the nursing schools of Bellevue, Johns Hopkins, New York, Presbyterian, St. Luke's, Hunan-Yale, and other great hospitals. These constituted the "Training School for Nurses at Vassar College" suggested by an alumna and trustee of Vassar College, Mrs. John W. Blodgett, endorsed and recruited by the alumnae of Vassar as their most important war work, accepted by the college trustees, and backed financially by the American Red Cross.

The curriculum of the course was devised by such prominent members of the nursing profession as M. Adelaide Nutting and Isabel M. Stewart of Columbia University and representing Natl. League of Nursing Education; Dean Annie W. Goodrich of the Army School of Nursing; Jane E. Delano of the American Red Cross; superintendents of hospital nursing schools like Miss Maxwell of Presbyterian, Miss Hilliard

of Bellevue, Miss Clayton of Philadelphia General, Miss Gray of City of New York, Miss Wood of Massachusetts General at that time, Miss Johnson, then at Albany, later of Massachusetts General, and Miss Logan of Cincinnati General. These women all assisted in the organization of the Camp. Herbert E. Mills, professor of Economics in Vassar, was entrusted with the organization and administration of the Camp with the title of Dean.

The plan in brief was a 3-months intensive training in fundamental sciences—anatomy and physiology, bacteriology, chemistry, elementary materia medica, nutrition and cooking, history of nursing, elementary nursing procedures, psychology, social economics—on the Vassar campus.

At the end of this period training was to be completed in leading hospitals over the country of which over 40 had agreed to coöperate. Students took an average of over 30 hours a week in lecture, laboratory and hospital practice ward. Their ability, enthusiasm and fine spirit made this a wonderful group.

Of the 435 all but 17 finished the hard summer's work; and for most of the 17 who withdrew there were good excuses such as illness or family deaths. About 400 entered their hospitals as probationers in September. Almost at once they were plunged into the horrors of the influenza epidemic, rendering invaluable service in that calamity. Five died during it and 2 later because of its results. Right after the epidemic came the armistice, and as patriotic service in time of war was uppermost in the minds of these nurses a number withdrew shortly after peace was declared. But despite influenza and peace, nearly half of those who entered hospitals finished their training and became registered nurses.

At a reunion held at Vassar at Thanksgiving time, 1920, attended by many of the nurses and a good number

of superintendents of nurses from various hospitals, a very frank but good natured discussion of nursing education and hospital conditions took place, illuminating to officials as to the reaction of intelligent young women to the existing situation, but equally so to these young women as to the difficulties under which superintendents labored.

What has become of this group? Among them are superintendents and instructors in nursing schools, directors of university public health nursing courses, directors of public health nursing associations; teachers of hygiene in normal and other schools. With few exceptions they are all holding executive positions in nursing. They have been called to China, to South America, to Europe. Many have married and assert that what they learned at the Camp was the best possible preparation for home keeping and motherhood. Over and over they declare that that summer was the greatest experience in their lives.

To commemorate the Training Camp for Nurses a beautiful gateway to the college campus has been constructed, and it was dedicated June 8, Vassar's Class Day. Escorted by the senior class in their Class Day attire, singing marching songs, officers and students of the Camp marched to the gate where brief speeches were made by Mrs. Blodgett, President MacCracken, Mrs. Priscellia Barrows Sheldon, a student in the Camp, and Dean Mills. Part of the cost of the gate was met by students who had been connected with the Camp. By vote of the Vassar trustees the gate is to be called "Mills Gate" in honor of him who administered the undertaking and who has just retired from the college faculty after 41 years of service.

Public Health Nursing Records—
The never ending bugbear of most public health nurses is the record they are asked to make of their work. Often in

the press of duties they forget how vital records can be made, that they are not an end in themselves, but a means to an end.

In his recent book *Health on the Farm and in the Village*, Dr. Winslow cites an analysis of the use of records from the Manual of the Visiting Nurse Society of Philadelphia.

Nursing records are of value:

- A. To the Nurse, making her services to the family more complete—
 1. By helping her to be observant of all the factors that might affect the health of the family.
 2. By revealing the need of health work in each family and giving evidence of what is being accomplished.
 3. By constituting a summary of conditions found and of action taken.
 4. By improving the quality of the nurse's work, since the records also show what is being left undone.

5. By saving duplication and waste of effort, since they enable one nurse to begin where another has left off in work with any family.

B. To the Organization—

1. By helping in the supervision of work, thus making it doubly possible to do thorough and complete family health work.
2. By helping to show how far the organization is meeting the needs of the community and where further development is desirable.

C. To the Public—

1. By providing valuable material for morbidity and mortality statistics.
2. By showing what are the greatest health needs of the community.
3. By showing the social as well as the medical causes of sickness.
4. Through such statistical material it may be possible to get community or legislative action to remedy conditions.—

C.-E. A. Winslow, *Health on the Farm and in the Village*, 1931, pp. 175, 176.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

Dr. Lee K. Frankel—It is but fitting that this department should add its modest mead of appreciation of Dr. Frankel, the first formally elected chairman of the Public Health Education Section of the A. P. H. A.

More than any other one person, Dr. Frankel has initiated or sponsored various forms of effort for large scale "mass education" in health—in variety, extent, and unusually high average of quality.

The continued development of the health education projects of the Metro-

politan Life Insurance Company even beyond its present wide usefulness and extent will be an appropriate memorial to Dr. Frankel.

Today—If Not Already Done—If you have any health education-publicity material which should be displayed at Montreal, now is the last chance to send it. Address: Montreal Display, Evart G. Routzahn, 130 E. 22d St., New York.

Facilities for Utilizing Health Advice—In a discussion of "the legitimate field of public health agencies," Dr. J. W. Mountin, U. S. Public Health Service, emphasized, possibly without

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

intention, the comparative futility of offering health advice which calls for facilities lacking in a given community.

The health of the individual depends on his own efforts in a suitable environment. It is not sufficient that he understand the rules governing health and be willing to observe them; certain facilities must be made available to him. While measures for the prevention of disease and promotion of health find application in almost every phase of human activity, yet their full development will not be realized in any given community until some organization accepts their promotion as a major responsibility.—

Changing Status of Health Officer.
Ill. Health Quarterly, State Dept. of Public Health, Jan.-Mar., 1931. See for facilities to be provided and relationships of health agencies and physicians.

Believe It—Or Not—Middletown, N. Y., in its *Health Bulletin* under the above title:

1. You can't get smallpox if successfully vaccinated within 7 years.
2. You can't get typhoid if you've had 3 doses of the vaccines.
3. You can't judge the safety of the cook by the neatness of her dress.
4. You can't have unreported and unquarantined cases of contagious disease in your home without endangering your neighbors and arousing their enmity.

Welfare and Relief Mobilization, 1931—1. In all probability in many parts of the country there will be increased efforts to cut down health and medical services along with all welfare activities except actual "relief." 2. More than ever before there will be increased need for these services during the financial emergency. 3. The Welfare and Relief Mobilization is a common effort, especially in cities of 25,000 and upwards, to strengthen the position of all existing services—public and private—and to expand them to

meet emergency demands. 4. Health education and publicity workers may help in this nation-wide crisis by unceasing care and skill in helping to explain all health and medical services in their states and cities. 5. Good ideas and material which might be used in other cities may be sent to your national association for this wider use.

However much conditions may change for the better this fall unforgettable experience in the past has shown that high tide in the need for relief will not come until months later.

The interpreters of public health need to be very much on the job—to protect all services now functioning, and to seek emergency extension of service where needed. Close coöperation between local health and social agencies, public and private, will increase effectiveness and lessen complications.

When Half a Million Were Taught in a Day—The official motion picture film of the Shanghai Cholera Prevention Parade, with coffins and man-size flies, and Chinese policemen carrying health and cleanliness banners, will be shown at the annual meeting of the A. P. H. A. in Montreal. W. W. Peter, M.D., Dr.P.H., technical adviser to the Chinese Ministry of Health, now on leave of absence from his post as director of Health Service of Cleanliness Institute and formerly, for 15 years, connected with the China Council on Health Education, will sail August 26 to bring the film to America and expects to be at Montreal to greet old friends and new. It is probable that Dr. J. Heng Liu, director of the Ministry of Health, will send one or more representatives of the Health Education Division along with Dr. Peter for further study in the United States.

Between half a million and a million people saw the parade in Shanghai on Saturday afternoon, June 6, and it proved so successful that plans are al-

ready under way to repeat it next year. Altogether fully 2,500 persons took part, including Boy Scouts and Girl Guides of many nationalities, medical students, and others. Dr. Peter writes:

The teaching principle followed was to show first the wrong way of living. Then came possible consequences carried on stretchers, and after several stretchers one or two coffins. Each unit was attended by megaphonists who explained the unit to which they were attached. Then followed a visualization of the same subject showing the right ways of living.

A few simple lessons, graphically and dramatically presented, were the center of this elaborate parade as they have been of the entire educational campaign of which it is only a part.

Cholera spreads from sick to well through water, food, fingers, flies. . . . Cleanliness prevents cholera. Keep your hands clean. Use only clean water. Eat only clean food. Keep your home clean.

Before the day of the parade 10,000 posters were put up, chiefly on municipal property where no other advertisements were allowed. These bore illustrations of sanitary conditions involving washing of hands before eating; control of flies, sputum, and garbage, etc. The text in Chinese, English, and French read: "It is easier to prevent than to cure! Fight against cholera." In addition 150,000 handbills were distributed along the line of march. Newspapers gave generous space to the whole project, especially the Chinese papers, of which a number in Shanghai attain national circulation. Now that the parade is past, the motion picture film is being distributed throughout China and is to be shown in India as well.—Florence M. Seder.

Telling the Other Fellow—Here is one kind of letter which helps get good radio hours for health talks:

Station XYZ:

That was a bully talk on diphtheria by Dr. John Smith Tuesday evening. I hope that you will give us more good speakers on health subjects.

James Brown

If you and I and other listeners will write letters now and then to broadcasting stations telling what health talks we like it will count in getting good time for more of them. If you don't like the talk, be very sure to tell the station what was wrong with it.

"Fan mail" has much to do with what broadcasting stations and newspapers offer their audiences. Should we leave the letter writing to the followers of comic strips and astrologers?

How Prominent People Help—As reported in *News Letter*, West Virginia State Dept. of Health (July 15, 1931):

During a recent campaign for smallpox prevention in Middletown, N. Y., the mayor, who heartily supported the movement, had himself and his entire family vaccinated. Pictures were taken of the local health officer and nurse administering the vaccine. These were published in the local papers, and later in New York State *Health Bulletin*.

This idea could be happily used in many West Virginia communities. When planning an immunization campaign not only secure the coöperation of the mayor but have him visit your office, bringing his family, if he has children or grandchildren, and get a picture of the vaccination in process. Do all this prior to the campaign. Then see if your local papers will carry this picture, together with the story of the campaign. If necessary pay to have the picture inserted.

Where you cannot get your papers to use it, have copies of the picture made (enlarged if necessary) and used on posters in a few prominent store windows. This will attract much attention and create favorable comment.

This same publicity stunt might be used in connection with other prominent people in the community, such as the superintendent of schools, the leading merchant, or wealthiest man in town. Another way is to have one class in the school or the whole school, with a per cent immunization against diphtheria, typhoid and smallpox or all three, photographed and the picture used in a prominent place with proper caption.

What Health Topics for Social Workers?—The National Conference of Social Workers has a Health Division, usually holding 5 sessions. What kind of public health material should be presented at a national gathering of social workers? What problems, possibilities and technics in the field of public health should be presented in meetings largely made up of non-public health workers? Send your suggestions to the chairman, Anna Drake, Public Health Federation, 312 W. 9th St., Cincinnati.

Nearly Every One a Quack Doctor?—In "Medical Amateurs," radio talk by Dr. H. W. Haggard, is a striking picture of the conscious and unconscious quack practice of medicine. Splendid material on which to base talks and copy, and a document for widespread distribution. The simplicity of the writing is almost a model for health educators. *Free* from Eastman Kodak Co., Rochester.

How to Get Copies—The names of periodicals referred to in this department usually appear in italics. When you wish to secure a copy containing an article mentioned in this department it is wise to *quote the reference in full*. Then you guard against omitting essential facts. Certainly mention the date when one is given. Usually a health agency will send free single copies of its own bulletin or house organ, and usually copies of a magazine of general circulation must be paid for. The editor will supply omitted addresses, and usually can loan a copy, but *address the periodical direct* if you wish a copy all your own.

ADVERTISING

"Health Claims in Advertising" (*Hygeia*, Aug., 1931) presents several points, good and bad.

The magazine advertisements of the Metropolitan Life Insurance Co. con-

tinue to be a major contribution to direct health education. And they should be illustrative of possibilities in the selection and arrangement of material for other forms of printed health education.

"Building the Fortresses of Health" is the general title of a portfolio reproducing a series of page advertisements issued by Parke, Davis & Co., Detroit.

To tell some of the fascinating stories connected with medicine—to give people a clearer understanding of what the recent advances in medical science mean to them and to their children—to portray the part played by physician, pharmacist, and maker of medicines in safeguarding the health and happiness of the nation and the world—to tell the public at large who we are and what we stand for:—

Presumably they are scientifically sound. Certainly they are admirable examples of what can be done with pictures and words to present health material in readable form. Address the Company for a free copy.

RADIO

"Some Diseases We Don't Talk About and Why Not" (venereal diseases), by Massachusetts Socy. for Social Hygiene, over WBZ and WBZA. Also 5-minute talk on syphilis over WNAC. Any comebacks, Mr. Kiernan?

Health broadcasting was reported by the U. S. Public Health Service at the World Association for Adult Education meeting in August in Vienna. We quote a few paragraphs from the manuscript prepared by Asst. Surg. Gen. R. C. Williams:

An inquiry sent to each of the 48 state health departments of the United States indicates that in 15 of these states the health department regularly issues broadcasts on public health subjects. Such broadcasts are usually issued weekly, twice a month, or monthly. Six state health departments issue broadcasts at irregular intervals. The earliest state broadcasting was begun in 1922. Several of the states have been engaged in this work for a number of years. The combined population of the states that issue broadcasts regularly is

approximately one-half of that of the United States.

An inquiry addressed to the city health department of the 200 largest cities of the United States indicates that 18 cities regularly issue public health broadcasts, which are usually issued weekly, twice a month, or monthly. Seventeen cities reported the use of the broadcasts at irregular intervals.

Forty-two county medical societies prepare and broadcast regularly programs dealing with public and personal health.

According to information obtained through the American Medical Association, there is 1 city in the United States that has a rather unique arrangement. The city medical society, in coöperation with the state medical association, conducts a weekly broadcast. This broadcast consists of questions and answers. This particular hour is called Doctor K-R-L-D. It is located at Dallas, Tex. Great numbers of letters have come to Doctor K-R-L-D for attention. They are an evidence of an interest of the public, not only of the State of Texas, but all over the United States. No one knows the identity of Doctor K-R-L-D, and no one is permitted to tell who does know.

Here is a first attempt to classify the forms possible in broadcasting. Additional items, or entire re-grouping of the forms will be welcome.

Talk or speech: alone, or with music, dramatics or other features.

Music: with credit for sponsorship by the agency, or with other features.

Dramatic: monologue, conversation or dialogue, or play.

Questions and answers: answers to questions from listeners; answers to a group of questions supposed to be of interest to the audience; test questions offered to the audience—to be answered next week; possibly with awards for answers from the audience; test questions put to a prominent person with his answers checked on the spot or checked by answers next week.

Please report on any of the above which you have already tested.

CONTESTS

The Massachusetts Society for Social Hygiene, 1150 Little Bldg., Boston, announces a competition to secure a suitable manuscript for publication on sex hygiene, designed for adolescent boys and girls. An award of \$500 is offered

to the author of the manuscript selected.

The society has in mind a pamphlet on the important subject of sex hygiene which will be useful in developing a rational attitude toward sex problems on the part of young men and young women between the approximate ages of 14 and 18 years.

Such a pamphlet should contain quite definite statements about the physiology and psychology of sex, including the various aspects of the sexual instinct, and should refer to the temptations and dangers of sex, to autoerotic activity, to the more common abnormalities, and to the venereal diseases.

Recognizing the fact that young men and young women of the present day are considerably advanced in their information about life and sex, and are subjected to many influences tending to undermine the wholesome and normal attitude so necessary to meet the problems growing out of sex in young adult life, this society believes that this subject should be handled in a straightforward manner which has not characterized the usual sex hygiene pamphlet of the past.

Five judges of outstanding reputation in the field of education and social hygiene will judge the manuscripts and make the award.

All manuscripts must be submitted not later than October 1, 1931, when the contest closes. The manuscript should contain from 5,000 to 6,000 words. The award of \$500 will be made January 1, 1932. Write for the conditions.

State and national winners have been announced in the third annual Gorgas Memorial Essay Contest. Address the Memorial at 1331-3 G St., N. W., Washington, for details. About 12,000 contestants in 43 states participated. This should mean that a significant amount of reading and study of health topics was done by high school students. We venture the suggestion that a much larger number will participate next year if the Memorial Institute can

see the way to offer simpler and more unified subject matter for the essays.

The Ohio Public Health Assn., Columbus, awarded a first prize of \$50 to D. L. Mansell, *Canton Repository*, for "the best Christmas seal editorial appearing in an Ohio daily." S. H. Green, *Putnam County Gazette*, did the best editorial in a weekly. Mr. Green is a farmer who writes for various country newspapers.

NEWSPAPERS

An important coöperating agency in health education is the Associated Press, which distributes to its member newspapers a 6-day a week health column. Known as "How's your Health?" the column is written by Dr. Iago Galdston, New York Academy of Medicine. It is distributed by the Associated Press Feature Service in sheet form, 14 days at a time, each column running about 8½ inches in length. Early August topics: Choosing a Sanatorium; Causes of Stuttering; Stutterers; Superstitions; Children's Sun Baths; Glaucoma; Blue Mondays; Light and Tuberculosis—I; Light and Tuberculosis—II; Soap and the Skin; Leaking Heart; Heart Disease; When They Won't Eat; Mother as a Nurse. The column is being used by about 300 newspapers in the United States.

Some health workers complain that some newspapers are unwilling to mention the venereal diseases, but in at least one city health department annual report we find the same inhibition. "Social diseases" is as far as that health officer will go!

WORDS

In a recent issue of *New York World-Telegram* says Heywood Broun:

An old pet theory of mine is being strengthened day by day. As a matter of fact, it has ceased to become a theory. By now it is a conviction. I refer to the almost universal tendency of writers—particularly young

writers—to say too much. . . . The true artist in any field gets the best results through an economy of words or motions.

A plea for short words—from *The Wedge*, issued by Batten, Barton, Durstine and Osborn:

The reason we use short words to talk with is that they mean exactly the same thing to talker and hearer. When we drag in a lot of jointed words, we forget before the sentence is finished just what it was we were trying to say; and the other fellow never does find out. For the same reason, we use short words to think with. . . . Short words are easy and pleasant to read. The eye picks up their meaning without conscious effort. But the average reader stumbles over pompous words and loses his mental balance. They annoy and bore him. After about two staggers, his interest wanders and he turns to the next page.

DIPHTHERIA

"The Milwaukee Health Department urges all parents to have their children protected against Diphtheria" on the back of the August quarterly bills from the municipal water department. Includes list of diphtheria prevention stations in the section to which the bills are addressed. *Sample, 2 cents.*

"Diphtheria Waning" is simply a large type table comparing cases and deaths for 1900, 1925 to 1930. Effective. On coverpage of *Monthly Bulletin*, Phila. Dept. of Health. June, 1931. *Free.*

"Interesting the Public in Diphtheria Immunization," by Dr. J. L. Rice. *Conn. Health Bulletin*, State Dept. May, 1931. *Free.* How it was done in New Haven.

EDUCATIONAL MATERIAL

"The Periodic Health Examination—The Keystone of Preventive Medicine," by Dr. D. B. Armstrong. Metropolitan Life Insurance Co., New York. *Free.* Reprint from *New York State Journal of Medicine.*

"Addressing Lay Organizations on the Health Examination," by C. Ward

Crampton, M.D., 515 Park Ave., New York. *Free*. Reprint from *New York State Journal of Medicine*. Addressed to county medical society members who may be invited to speak before lay audiences. Not too much material to overwhelm the busy practitioner.

From American Society for the Control of Cancer, 25 W. 43d St., New York:

Important Facts for Women about Tumors. 14 pages; dated.

What Everyone Should Know about Cancer. 24 pages; 4th edition; dated.

A reprint on the need of cancer services. Important; on glossy paper.

The Endowment of Cancer Control Activities. 14 pages; one of the unhappily few examples of dignified presentation of public health for appealing to large givers. *Copies of above free*.

REPORTING

Inspired, we believe, by the colorful graphic presentation of statistics by the group in Vienna, Dr. Lee K. Frankel, through his Welfare Division of the Metropolitan Life Insurance Company, set a new high for statistical presentation in this country. Seeing Is Believing (happy title!): A Campaign to Lengthen Life Told in Pictures is a 14-page pamphlet recording "a carefully planned, persistent campaign of health education and nursing care." Every reader will want a copy; *every reader may have a copy upon request*.

The 27th report of Visiting Nurse Assn. of Somerset Hills: "for purposes of economy this statement replaces the usual annual report." A 6-page folder; 3½" by 8½"; effective selection of essential information; some will argue that it is all that an annual report needs to be—if adequate month by month interpretation has preceded it. "15,445 miles were traveled by one nurse doing school nursing." No office address is given and N. J. is not mentioned. The Baldrige poster of the nurse (issued

by the N. O. P. H. N.) makes an attractive cover design.

Four pages of the 1930 report of Infant Welfare Society of Chicago contain a picture story of the services rendered. Two photographs (3 by 3½) on a page with descriptive caption in middle of the page do a good job of explaining. The text of the reports would attract more readers by the addition of subject headings. *2 cents*.

"Health history in the making"—white letters on red bands across the top and bottom of a 6-page folder, 4¼ by 9½, annual report of Queensboro Tuberculosis and Health Assn., 163-18 Jamaica Ave., Jamaica, N. Y. Several good inside features better seen than described. It is not dated. *Samples free*.

Reporting that "New Haven Wins First Place" in the Chamber of Commerce of U. S. A. contest, *Health*, New Haven Dept. of Health, devotes its May issue to a symposium of congratulation and interpretation by the city's leading citizens.

Births, Infant Mortality: Local Distribution in Bellevue-Yorkville Health Demonstration. B-Y Health Demonstration, 325 E. 38th St., New York. 9 pages of maps and statistical tables reproduced in a fairly inexpensive form for such detailed data. The Demonstration will supply information on request.

THEY BELIEVE IN EDUCATION

"Education the Need" is argued in "A Rational Dental Hygiene Program for Municipalities," by Dr. C. J. Hollister. *Pennsylvania's Health*, State Dept. of Health. May-June, 1931. *Free*.

HONORABLE MENTION

To Bombay Presidency Baby and Health Week Assn., Bombay, India: for annual report with a table of contents.

COÖPERATING GROUPS

The National Advisory Council on Radio in Education, 60 East 42d St., New York, is one of the newest coöperating agencies. Established to advance adult education via broadcasting the council will seek to further health and social welfare presentation by radio. Health and social workers may become associate members, subject to approval by the executive committee, without payment of a fee. Valuable publications have been issued and others are in course of preparation. Levering Tyson is the director and recently Curtis E. Lakeman has joined the staff. Mr. Lakeman was formerly with the American Society for the Control of Cancer and the New York State Department of Health, both of which initiated some of the earliest health talks by radio. For publications on radio and information about the Council write to 60 East 42d St., New York.

Three years ago the Special Maternal Care Committee of the National Council of Women of Canada urged local units of the Council to organize for action. One result is reported in *Social Welfare*, Toronto (June, 1931), in the study of conditions in Toronto and an intensive speaking campaign which reached its climax on "Mother's Day."

"Parent-Teacher Associations and The Family of Tomorrow," by N. W. Edson. *Journal of Social Hygiene*, 450 7th Ave., New York. May, 1931. The opportunity and some methods.

Study courses on the preschool child and on child training are offered by *Parents' Magazine*, 255 4th Ave., New York. Based on magazine articles, discussion outlines, debate topics, etc. *Information free*. Dr. B. C. Gruenberg is co-author of the preschool series.

"Toward Understanding Children," *University of Iowa Extension Bulletin*, Iowa City. Feb. 1, 1931. Interesting example of university coöperation with a state conference on child development

and parent education. 95 pp. *Price unknown*.

More than half of Kiwanis Clubs of the United States and Canada are in places of less than 10,000. Missoula, Mont., has Rotary, Lions and Kiwanis with a total membership of 220 of which 108 are Kiwanis. Missoula was one of four Kiwanis given awards in the annual "efficiency contest." Among the several score activities were included: advocated and assisted in forming a public health council; assisted in Red Cross Roll Call and Christmas Seal Sale; assisted in furnishing milk to underweight children in the public schools; secured a school dentist and paid \$158.00 toward his salary; investigated and advised employment of a public health nurse in the public schools; furnished glasses for needy children at a cost of \$70.00.

Have state departments or state associations worked out plans for co-operation with these clubs—satisfactory to the service club and economical for the health agency?

CAMPAIGNS

In the July JOURNAL under Diphtheria we quoted D. M. Griswold, M.D. (*Ill. Health Quarterly*, State Dept. of Public Health. Jan.-Mar., 1931), on the significance of "mass movements." Dr. Griswold has some questions as to the campaign as a method:

I feel, however, that campaigns on diphtheria prevention or tuberculosis examinations, etc., should be used only in the early days of a piece of work and should soon be discontinued. Campaigns depend too much upon emotionalism and such undesirable emotions as fear and dread for their success. We should, therefore, cease as soon as possible the idea of campaigns for doing things that we should do. We should eliminate all such wholesome emotions as fear and dread and replace them with such positive ideas as the desire for good health; the desire for sound teeth; the desire for immunity against all diseases as far as that is possible.

BOOKS AND REPORTS

Bacteriology—Especially Determinative Bacteriology—By Dr. K. B. Lehmann and Dr. R. O. Neumann. *English translation of the 7th completely revised German edition. Volume II—Part I. General Bacteriology. Part II. Special Bacteriology. Edited by Robert S. Breed, New York Agricultural Experiment Station, Geneva, N. Y. New York: Stechert (Alfred Hafner), 1931. Price, \$12.50 for 2 Vol.*

The work of Lehmann and Neumann has for many years been a standard text used in several countries. The present volume is translated from the 7th German edition. Needless to add, a work which has gone through so many editions has not only received the benefit of criticism, but has proved its value.

The preparation of the English edition has required more than 2 years and the original had brought the material up to February, 1927. It is evident therefore that some of the material cannot be regarded as entirely up-to-date. The object and character of the book, however, lessen the importance of this, though there are some serious omissions which we believe the editor would have done well to have supplied in footnotes, a typical example of which is found under "Methods of Cultivating the Tubercle Bacillus." Some 8,000 citations are given, mostly German, though a fair attempt has been made to include the work of bacteriologists in other countries.

The editor believes that the outstanding "value of this book lies in its systematic arrangement of our knowledge regarding the still too imperfectly known and numerous types of bacteria." In this we agree. He acknowledges the

impossibility of a satisfactory classification of bacteria, but expresses regret that Professor Lehmann shows a tendency to modify the rules of nomenclature. We believe that Professor Lehmann has the best of the argument on this point.

Including 3 appendixes, there are 827 pages of text, into which a vast amount of recorded knowledge has been condensed, with a good index of 39 pages. As stated in the preface, the book has been published with little expectation of financial returns. To the editor and his assistants, as well as to the firm which is responsible for this English translation, a debt of gratitude is due from all bacteriologists.

The printing and binding, which were done in Germany, are excellent, and there are very few errors. The work can be commended without reservation to bacteriologists. M. P. RAVENEL

Practical Clinical Psychiatry for Students and Practitioners—By Edward A. Strecker, M.D., and Franklin G. Ebaugh, M.D. (3d ed.) Philadelphia: Blakiston, 1931. Price, \$4.00.

In the third edition of this popular textbook there are many new illustrations, and a new chapter of 63 pages on "Some Practical Aspects of Child Guidance Problems" has been added. In general, the rest of the text shows no important changes from the second edition. The general manner of presentation of material is excellent. The giving of actual cases does much to give the student a better understanding of the subject.

Minor criticisms might be made of the presentation of certain topics. In dis-

cusssing mental deficiency we find the statement that a moron has an intelligence quotient of from 50 to 74 and a mental age of from 7 to 10 years, two ratings which are somewhat contradictory.

The book is undoubtedly one of the best texts on psychiatry which we have at the present time and should continue to have wide use. KARL M. BOWMAN

The Significance of Water-Borne Typhoid Fever Outbreaks, 1920-1930—By *Abel Wolman and A. E. Gorman*, with a Foreword by *Thomas Parran, Jr.* Baltimore: *Williams & Wilkins*, 1931. 82 pp. Price, \$2.00.

The present-day emphasis in the public health program on personal hygiene has tended to obscure not only the undisputed and far-reaching accomplishments of sanitation but also, and more important, it has in a measure obliterated the fact that we still have in many communities dangerous problems in water supply and sewage disposal. The solution of these through measures which have been proved time and again to be effective are fundamental prerequisites to any elaboration of community programs for child hygiene, infant welfare, and personal hygiene, which are today receiving such great attention. This analysis of the major causes of water-borne outbreaks of typhoid fever and dysentery and the chronological record of 240 outbreaks in the United States and Canada comes therefore as a timely warning and emphasizes the dangers to which we are still exposed.

The authors are to be particularly congratulated and thanked for the clarity of their dissertation in a field which has not been marked for the lucidity of its reports.

Some of the tables would be helped by footnotes explaining that the symbols classifying the outbreak are taken from the excellent outline in Table 4.

The record indicates 7 repetitions of

outbreaks in the same city, of which 4 were from the same cause (rather than 5 and 1 as stated by the authors in their conclusions). Of the 8 states reporting no outbreaks during the decade, 2 are southern, but it is interesting to note that, with the exception of Maryland, all 5 states in which repetition of outbreaks occurred are in the north (Indiana, New York, North Dakota and Wisconsin).

This should prove a valuable source book for teachers, engineers and health officers. HOMER N. CALVER

The Measurement of Nervous Habits in Normal Children—By *Willard C. Olson, Ph.D.* Minneapolis: *University of Minnesota Press*, 1929. 97 pp. Price, \$2.00.

Dr. Olson's book is a report of a study which he conducted at the Institute of Child Welfare at the University of Minnesota and in the Minneapolis public schools. In the preliminary study the children were observed in the schoolroom for the manifestation of oral, nasal, hirsutal, ocular, aural and genital habits.

Of all those under observation, oral habits correlated most highly with the total score. In the main study one point was given for one or more manifestations of an oral habit (thumb sucking, finger sucking, nail biting, protruding tongue) per each 5-minute period of observation. As the most reliable procedure was found to be twenty 5-minute observations of each child, a child's score might be any number from 0 to 20, with the higher scores the more undesirable. For the main body of the study 636 children were observed in grades 1 through 8 of a single elementary school.

The scores of oral habits were found to distribute themselves over a normal curve so that "Properly stated the question concerning a child is not, 'Is he nervous?' but 'How nervous is he?'"

Apparently age, grade location and degree of intelligence had little influence upon the amount of habit manifested by the individual child. A reliable sex difference was, however, indicated in favor of the boys.

Consideration was given to the incidence of nervous habits among children of the same family; the effect upon the child of association with persons of nervous habits, outside the family group; the influence of fatigue, nutritional status, and length of breastfeeding upon nervous habits, etc. While certain relationships are indicated statistically in all these instances it is as yet impossible to talk in terms of causation. Dr. Olson recognizes the variability and multiplicity of factors in human affairs and is consequently cautious in drawing his conclusions.

The study is valuable because it is an adaptation of what Dr. Olson calls the "natural history approach" to controlled methods of research; we may await with interest the results of his further investigations.

JEANETTE REGENSBURG

Medical Jurisprudence—By *Alfred W. Herzog, M.D.* Indianapolis: Bobbs-Merrill, 1931. 1051 pp. Price, \$15.00.

Books devoted to medical jurisprudence usually deal either solely with the legal aspects, or else with the medical, and only rarely with both. This may be because they are written either by lawyers or by physicians and seldom by anyone who combines these two professions.

This ponderous volume by the editor of the *Medico-Legal Journal* is both legal and medical. Some parts of it will be valuable to the physician in pointing out his legal rights and liabilities, while others will serve as useful information for the lawyer by giving him more or less scientific discourses on various phases of medicine.

Among the 56 chapters is a rather brief one entitled "Health and Sanitation Authorities," which presents principles based on numerous court decisions with reference to the creation and organization of health authorities, their powers and duties, and liability for expenses. This material would probably be of interest to a practising physician, but not of great value to a health official or to a lawyer involved in public health litigation.

The book contains an extensive table of cases, a good index, and a fair bibliography. The references would have been improved if all the cases had been dated, despite the labor which would have been involved. This volume will be found of value for reference by those interested in medico-legal problems, even though the discriminating reader may not agree with all that is said, or with the interpretation of some of the legal decisions cited.

JAMES A. TOBEY

International Studies on the Relation Between the Private and Official Practice of Medicine with Special Reference to the Prevention of Disease—Conducted for the *Milbank Memorial Fund* by Sir Arthur News-holme, K.C.B., M.D., F.R.C.P. Vol. I. *The Netherlands, Scandinavia, Germany, Austria, Switzerland.* Baltimore: Williams & Wilkins, 1931. 248 pp. Price, \$4.00.

The publication of a series of International Studies on Medical Practice in various countries is an event of very special interest. We are beginning at last in this country to emerge from adolescent self-satisfaction and to recognize that older nations have much to teach us, particularly in the field of social organization. We could have no better instructor than Sir Arthur News-holme, whose wide experience as Chief Medical Officer of the Local Government Board of Great Britain equipped

him admirably for a survey of the health problems in other lands.

In this, the first of three volumes, are many specific lessons which may prove of significance to us in the solution of similar problems. In the chapter on Holland we have an opportunity to observe extraordinary success in the development of private mutual medical organizations for the treatment of disease under a system of voluntary co-operation; and to note the effect of a properly organized midwifery program on the maternal death rate.

In Denmark we find a development of hospitalization of unique completeness and a voluntary system of sickness and invalidity insurance which, without compulsion, has secured as wide a coverage as is obtained under compulsion in Germany. Here also we have an experience of nearly a century and a half in the treatment of venereal diseases under government auspices.

Sweden was similarly a pioneer, and has ever since been a leader, in the field of vital statistics with a system of registration dating back to 1748.

Norway presents a picture of a highly developed local health organization in which the medical officer is the key to the entire medical work in each commune, and its insurance system in which the doctor is paid on a service rather than a per capita basis is an interesting contrast to the methods in many other countries.

Germany illustrates the advantages and disadvantages of an extensive compulsory insurance system and of a wide variety of only partially coördinated social welfare organizations. The history of unfortunate conflicts between the medical profession and the public is fairly and fully told in its bearing on collective versus individual bargaining between the insurance fund and the physician. The case of the physician against the German system is fully and adequately presented.

The chapter on Austria presents a somewhat better picture and shows the working of a program in which district physicians are on a salary basis which does not depend directly either on specific services rendered or on the number of persons served. There is also considerable freedom with regard to the consultation of physicians not members of the official staff. The arguments against this program are presented in a significant quotation from Dr. Georg Weinlaender.

Finally, in Switzerland we see conditions somewhat more like those of the United States with 25 small cantons enjoying more or less complete home rule, some of them having compulsory sickness insurance and others not.

More detailed analyses of certain of these European systems can be obtained from the studies of the League of Nations and the International Labor Bureau. For a general picture in brief compass nothing could be better than this volume. It is accurate, dispassionate and well balanced. It should be invaluable to all thoughtful students of this problem as opening up new vistas of international experience in a most important field. C.-E. A. WINSLOW

Psychology for Nurses—By Fred A. Moss, M.D., Ph.D. Boston: Houghton Mifflin, 1931. 273 pp. Price, \$2.50.

This book, instead of leading the reader through a maze of definitions and then through a dry discourse on the anatomy and physiology of the nervous system, plunges into the practical aspects of psychology as a nurse needs to know them in her contacts with her patients and coworkers. She learns how to analyze and understand her own attitudes and emotions in order to be able to understand those of her patients.

Part I deals with Psychology and its Place in Nursing. Under this are such topics as, Traits People Have in Com-

mon; Factors Influencing Behavior; Effects of Bodily Conditions on Behavior; and chapters on Mental Disorders and Psychology and Delinquency.

Part II deals with Individual Differences, with chapters discussing individual differences due to race, family, training, age, sex, and emotional outlets. The chapter on Differences Due to Race, especially as it touches the negro, race prejudices and race differences in achievement, is especially good.

Sociology and mental hygiene are linked up with psychology in a way to make them all vivid, vital, and practical. It is refreshing to have an author realize that in most nursing schools now the subjects taught are of college grade and the textbooks do not need to be couched in language and form that a seventh or eighth grader can understand.

But why limit this book to nurses alone? Everybody could read and study it with interest and profit. I recommend it unreservedly.

EVA F. MACDOUGALL

So Youth May Know—By Roy E.

Dickerson. New York: Association Press, 1931. 255 pp. Price, \$2.00.

This is one of the most satisfactory books on social hygiene for boys yet written. The author has combined authentic data with sound philosophy. He has avoided "wishy-washy" sentimentalism and fearsome sensationalism—those two most distasteful concomitants of many previous volumes in this field. His treatment of such subjects as prostitution, masturbation, syphilis, and gonococcus infection, is in keeping with the best modern thought. Above all, his emphasis on decency and cleanliness makes his effort a guide-book rather than a mere series of "don'ts."

To sum up, here is a short, readable book which we can safely recommend for reading by boys of from early teens on. The preface adds nothing of value.

RAY H. EVERETT

Military Preventive Medicine—By George C. Dunham, M.D. (2d ed.) Carlisle Barracks, Pa.: Medical Field Service School, 1931.

That a second edition of this book has been called for in less than a year speaks well for it. The new edition has been revised, brought up to date, and two chapters—one on the administrative features of physical examinations, and the other on vital statistics—have been added. Fifty-four additional illustrations have also been included.

The good impression made by the first edition has been strengthened. The book is more complete and more valuable than before.

M. P. RAVENEL

Health and Human Welfare—By William E. Burkard, Ph.D., Raymond L. Chambers, Ph.D., and Frederick W. Maroney, M.D. New York: Lyons and Carnahan, 1931. 532 pp. Price, \$1.40.

This is another addition to the rapidly growing list of health textbooks for secondary schools.

The book is prepared in the usual textbook style with large type and numerous simple illustrations. At the end of each chapter is a list of questions followed by a concise summary of the subjects discussed. It should be easy for teachers to use and will probably make health interesting to children. There are numerous chapters whose application must be made at home, such as "Care of the Baby," and "Care of the Sick." A special section is devoted to "Information for Parents," adapted from a pamphlet prepared and used by Dr. Maroney when he was director of health education in the Atlantic City Public Schools.

Frauds, quacks and patent medicines are given well deserved space, and the problems of adolescence are presented, in a chapter called "The Spring of Life," in a careful and pleasing manner

that should be easily understood and yet not offensive to anybody.

In reading this book one gets an impression of frequent unnecessary repetition and occasional misplaced emphasis. An example of the latter are 4½ pages of directions on how to clean the teeth and only passing comment here and there on the value of diet in building strong teeth. Certainly scurvy is no longer a health problem, yet 10 pages are devoted to it.

Evidently the authors are not advocates of pasteurized milk and the following statement will not get unanimous approval—"To safeguard infants from scurvy they should be given liberal quantities of raw milk, if possible." For this reason "certified milk is better than pasteurized milk although it is more expensive." Nothing is said about milk-borne epidemics or the part pasteurization has played in stopping and preventing them.

Although an effort has evidently been made to touch on all the subjects relating to public health, no mention is made of water purification or sewage disposal. Chapters on "The Romance of Sanitation" and "Health and Science Today" cannot be considered complete with such omissions. A diagram showing the decline in typhoid fever death rates is described as showing "some striking results of the rise of the preventive treatment (inoculations) against this disease." None of the other far more important causes are mentioned.

In a brief description of "ringworm" only the old fashioned kind is mentioned. Nothing is said about the much more serious fungus infection between the toes which is now spreading rapidly and attracting so much attention. Other errors are not serious but ought not to escape a careful editor.

Bacteria in the form of chains of dots are called "cocci." The "spirillin" is given as the kind of bacteria that causes cholera. We are informed that pas-

teurized milk is that which has been heated to 122°-125° for 20 to 30 minutes, but the correct temperature is given in another connection. No doubt such errors will be corrected in the next edition.

We also should like to call the authors' attention to the omission of the name of the American Public Health Association from the list of national health organizations and that of "other organizations from which health education materials may be obtained."

JOHN HALL

The Story of Health—By Hope Holway. New York: Harper, 1931. 150 pp. Price, \$1.25.

No person can rightfully claim to possess that desirable attribute known as a liberal education unless he is cognizant of the principles of hygiene and sanitation. No student should ever leave school without this fundamental knowledge, which may be acquired in part by the historical method, since tradition and experience are among the best of all teachers.

In this attractively printed little book, the wife of an eminent sanitary engineer has presented a concise and readable summary of the history of medicine and the development of modern public health, a story which Dr. Logan Clendenning recommends in a brief foreword as the first course of reading for the young person to take outside the regular school texts.

The book covers a comprehensive field in a succinct but interesting manner. More space than approximately 2 pages might, however, have been devoted to Pasteur, possibly at the expense of the rather lengthy description of magic and the disease dispelling charms and sorceries of ancient man. Although some of the more recent episodes in the conquest of disease are rather sketchily presented, this narrative should inspire interest in the more com-

plete stories as given in a number of recent books about "microbe hunters" and "riders of the plagues." For this purpose, a useful bibliography is appended. There is a good index and also there are many excellent illustrations by Elmer Hader.

Mrs. Holway's volume can be recommended as one of the best of the texts on the history of public health designed for schoolroom use.

JAMES A. TOBEY

Proceedings of Ninth Annual Water Works School, University of Kansas, Lawrence, February 11, 12, 13, 1931.

The proceedings of the ninth annual water works school covered a number of branches of the water works profession and allied professions. The subjects included were sources of water supply; water treatment including softening, filtration and sterilization; biological and bacteriological examinations and control; plant operation; distribution and financing. Related papers touched upon the subjects of design and operation of sewage treatment plants; induction motors; concrete admixtures; swimming pool sanitation; and accidents and causes.

A paper on mottled enamel of the teeth, by R. W. Kehr, was of particular interest in that it brought out the extent of this dental defect in the State of Kansas and its relationship to municipal water supplies. The percentage of school children with mottled teeth in the infected areas varies from a very high percentage for those starting use of the municipal supply at birth down to zero for those starting its use at the age of about 14. Contributing causes of mottled enamel appear to be sodium bicarbonate in the water or a combina-

tion of sodium bicarbonate and a low total hardness. More complete chemical analyses in further studies is essential.

VINCENT B. LAMOUREUX

Chemistry for Nurses—By Harry C. Biddle, A.M. Philadelphia: Davis, 1931. 322 pp. Price, \$2.75.

This book is the outgrowth of a lecture and laboratory course which the author gave over a period of years in several large Cleveland hospitals.

The National League of Nursing Education recommends a 45-hour course in chemistry as an essential minimum for the nurse's training period which the material in this text is designed to fit.

One cannot but be impressed with the orderly arrangement of the book. Part I deals with Inorganic Chemistry, Part II, with Organic Chemistry. At the beginning of each chapter are several short questions reviewing the previous day's lesson; this furnishes efficient repetition to assure permanence of learning. Then comes an outline of the day's lesson, followed by some practical questions to stimulate interest. There are review questions at the end of each chapter, followed by Topics for Oral or Written Reports and Suggestions for Posters, Charts or Exhibits. Each chapter ends with a manual for laboratory work with several blank pages added for personal notes.

In the long appendix practical aspects of vitamins, milk, blood, urine, antiseptics and disinfectants, etc., which the nurse needs to know, are taken up.

This text is really professional in that only such facts and principles as have a bearing upon the work which the student must face are taken up. The book is recommended very highly. Its only drawback is the sheen on the paper.

EVA F. MACDOUGALL

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

Suffolk County, N. Y.—How a county health department in a 2 years' period has brought about the coördination of existing services, removed overlapping, and filled gaps in health machinery is described in this 1930 report. A generalized nursing service on a township basis has been established, and supervision of milk production on a county-wide basis has been provided. All licenses and permits such as those for milk, boarding homes for children, maternity homes and the others required by the public health law and sanitary code are issued after inspection by the County Board of Health.

A veterinary division, the first of its kind in the state, was established under the board of health. Bovine tuberculosis eradication has been completed in addition to extensive investigations of other diseases of animals. Camps are regularly inspected during their period of operation as to water and milk supplies, sewage and garbage disposal. All records with reference to the work of the department are maintained in the central office and are readily available for consultation or other information purposes.

This county of 169,463 population records an infant mortality rate of 52. The expenditures for the last fiscal year amounted to \$63,000.

Hartford, Conn.—On the basis of a population of 164,072, a resident death rate of 10.5, a tuberculosis rate of 70, a cancer rate of 103.6, and a heart disease rate of 234.6 are reported. An infant mortality rate of 62.8 is noted. There were no deaths from diphtheria. The milk supply is obtained from tuberculin tested cows and over 90 per cent is pasteurized.

The Visiting Nurse Association furnished bedside care, case supervision,

and follow-up work of tuberculosis under the general supervision of the Board of Health. A somewhat similar arrangement has been made for providing child hygiene nursing services. A study of the causes back of the deaths of infants under 1 year of age revealed that in 97 per cent of the deaths from prenatal causes, the mother had not had adequate prenatal care, and in 81 per cent of those from postnatal causes, there had been no medical or nursing supervision before the illness.

With the prenatal, postnatal, and child welfare services available at the clinics of the hospitals, the Hartford Dispensary, and the city, there are sufficient facilities for all mothers and babies not receiving adequate care from their private physicians. The difficulty seems to be in convincing a certain type of mother of the need of the service.

A survey of the Charity and Health Departments of the city resulted in recommendations for the consolidation of the isolation and municipal hospitals under management of a board of public welfare and for 3 additional full-time physicians for the board of health to head bureaus of communicable disease, tuberculosis, and child welfare.

The prevention of disease rather than the treatment of the sick is considered to be a proper function of the Board of Health, and the operation of the isolation hospital as a part of the municipal hospital under the welfare board instead of as a separate unit will present distinct advantages.

New Hampshire—Increasing demands from the public for the assistance of various departments of the State Board of Health are indicated in the 31st report for the period ending June 30, 1930. A steady increase in the number of samples of public and semi-public water supplies analyzed is noted. Progress is being made in the

elimination of lead pipes from water systems. The water supply problem presented by summer tourists and campers is growing. "Withal, it means that all such sources, and, indeed, all surface sources, should be chlorinated, as a safeguard."

Tuberculosis control work is conducted by the State Tuberculosis Association, which is financed by the sale of Christmas seals and by contributions. In 1928 there were 305 deaths from tuberculosis, all forms, as compared with 234 (185 pulmonary) in 1929. Much diphtheria immunization work is reported in many of the cities and towns, particularly in Claremont. The division of maternity, infancy, and child hygiene has developed, among other things, hygiene class work for the junior and senior girls in the high schools of the state. The course comprises 7 lectures followed by a written examination. If a mark of 85 is attained, a Certificate of Hygiene is given to the pupils from the State Board of Health. Community classes for adults and Little Mothers' classes for girls between the ages of 10 and 14 are conducted by staff nurses. Monthly health bulletins are widely distributed.

Shanghai, China—The 1930 public health department report of Shanghai consists of 82 pages, besides a table of contents at the front and an alphabetical index at the back which increase the usefulness of this interesting document. The foreign death rate was 18.15 and the Chinese death rate recorded was 16.42 per 1,000 population. Of the total deaths included in the foreign death rate, 63.3 per cent were among Asiatics other than Chinese, while 53.6 per cent of the whole were Japanese.

A somewhat heavy mortality was noted among both foreigners and Chinese from measles. An increased incidence of this disease is recorded every second year. Of the major dis-

eases, cholera and smallpox showed a comparatively slight incidence. A very large increase in the number of malaria cases was noted. In general administration, steady progress is noted in the organization and control of licensed food and other premises. Structural improvements in dairies as laid down by the 1924 milk commission were completed.

Educational opportunities are discussed and it is noted that the Senior Chinese Medical Officer in the Public Health Department proceeded to Liverpool under the Holt Scheme with a view to postgraduate study in tropical medicine and hygiene. Plans have been perfected for the voluntary registration of medical practitioners, dentists, and veterinary surgeons. The report contains many excellent graphs and statistical tables.

Cleveland, O.—Cleveland's 1930 health report opens with a service directory, followed by an index of statistical tables and subjects discussed. The death rate of 10.99 per 1,000 population is considerably lower than that of the preceding year, 12.29, when an increase in influenza and pneumonia as well as a clinic disaster unfavorably affected the rate. The incidence of communicable diseases was low in 1930, with the exception of a sharp outbreak of poliomyelitis which began late in the summer, reached a peak in late September and declined in the late autumn. Infant mortality has fallen from 85.9 in 1920 to 54.48 in 1930.

The number of cases of tuberculosis reported has not materially increased or decreased in recent years, but tuberculosis among colored persons has become an increasingly important problem. About 16 per cent of the cases reported and 37 per cent of the deaths are among colored persons, although this group represents only about 8 per cent of the total population. In the

administration of a tuberculosis program the control of contacts is recognized as an important factor. At the central office of the bureau of tuberculosis a master file of all contacts 18 years of age and under is maintained, and contains 13,578 cards, 7,466 of which are for children under 12 years of age. Reference is made to a recent survey of existing conditions pertaining to the prevention and control of tuberculosis in the city and county.

For administrative purposes the City of Cleveland has been divided into 8 health districts, shown on a map. District health stations serve as centers for the field work of public health nurses and also offer clinic service for child hygiene and tuberculosis control. A district physician is also assigned to each station in order to render medical care to the indigent sick. Medical care to convalescent or ambulatory cases, which have been previously attended in the home by district physicians, is provided for at the health stations to a limited extent. A branch office of the bureau of sanitation is maintained in one station.

The area supplying the city with milk extends to several points beyond the state of Ohio. Whenever inspection is carried on at points more than 150 miles distant from the city, the cost is borne by the shippers inspected. All milk is from tuberculin tested herds and 99 per cent is pasteurized.

Montclair, N. J.—The 1930 health audit of the town of Montclair opens with a photograph of new quarters in a separate health center building, where "We are now able better to house and control our different clinics, our nursing bureau, and other activities, and we wish to emphasize the fact that the department has been furnished with a strong weapon for the control of contagion in the town."

During the year, there was added a

director of nurses, whose function is not only to direct the activities of health department nurses, but to coördinate the nursing services of the private as well as public organizations. The work of the Visiting Nurse Service of the Montclair Red Cross (Public Health Nursing Bureau) was taken over under an agreement with the Community Chest that the service would be financed by that body provided direct supervision were given by the Department of Health.

Another activity instituted by the Health Officer was the Birthday Greeting Card, sent on the first birthday of all children born in Montclair. This educational plan aims to attract the attention of the parent to the necessity for abundance of sleep, fresh air and sunshine, together with preventive measures that can be taken to keep the child free from contagion. The card is printed in two colors, blue and pink, with an envelope to match. An infant mortality rate of 35.4 is reported.

Baltimore, Md.—In the 1930 report of the Baltimore Health Department, vital statistics rates for the past decade have been adjusted on the basis of the population figures of the last federal census. The 1930 population at mid-year was 806,607, of which 143,557 were colored. A death rate for the year of 13.9 is recorded, 12.7 for the white and 19.6 for the colored persons. Figures are presented to show that the greatest effect in the reduction of the number of cases and deaths from typhoid was produced by the purifying of the drinking water (1911-1914) and the pasteurization of milk (1918). A case rate of 16.36 and a death rate of 3.35 are reported for 1930.

A quotation from the Health Officer's report on the bureau of child welfare seems appropriate.

Since this bureau was established in 1919, its work has been shown to be more and more important, because of its taking advantage of

the opportunity of being the first agency to teach parents and expectant parents many important factors in care of children; their nutrition, immunization against disease (smallpox and diphtheria), and the removal of physical defects that might become factors in preventing proper development of the child.

We consider that the child in the preschool age (birth to and including the 5th year) is in a period of life when a great deal may be done to insure vigorous childhood. Indeed, our work begins before the child is born, by counteracting syphilitic infections and organic lesions in the expectant mother, so that a live, healthy child may be born.

We recognize that unusual care must be taken by us to avoid encroaching upon the private physician's domain and we exercise it. Physicians will be of great service to us and to the citizens if they themselves will provide the necessary proper instruction and care in these cases that will prove attractive to parents, because we are inclined to believe that such activity will bring them closer and closer to the people as proper instructors in public health work.

Sarawak, Borneo—Interesting photographs and charts characterize the 1930 health department report of Sarawak. Among the various charts and graphs on permanent display in the health office are an administrative map of Sarawak, indicating communications, facilities, and the like; working maps showing water supplies, trades, conservancy and latrines, dairies, abattoirs (regularly flagged and corrected by district inspectors); a mosquito spot-map displaying the result of two anopheline mosquito surveys; weekly birth and death chart with quarterly rates; annual infant mortality rates with Malay and Chinese components; a map of the whole Eastern Arena, comprising the quadrilateral figure between the points Port Said, South Africa, Japan, and New Zealand. On receipt of the weekly wireless broadcast from the League of Nations office at Singapore the infected ports are flagged and the danger points thus instantly recognizable.

A small public health museum is at-

tached to the health office and deals with child welfare, malaria, mosquitoes, rats, food supplies, building materials, scavenging, conservancy, disinfectants, poisonous animals, meteorology, and water supplies. The visitors to this museum during the year numbered 977; and, of these, 452 were Chinese, 386 Malays, 54 Dyaks, 32 Indians, and 38 Europeans.

West Riding of Yorkshire—The 23d annual report of the school medical officer of West Riding of Yorkshire states that the question of nutrition was the chief object of scrutiny during the year. The policy of providing milk midway through the morning was continued and the amount of milk, whether free or in return for payment, was considerably increased. No systematic inspection has been made of the number of persons falling below the poverty line, but the existence of unemployment insurance is believed to prevent the submergence of many families below that line. Some families keep above by extraordinary management, and others fall below for the opposite reason.

A complete examination includes the three statutory age groups—(1) entrants, (2) intermediates, and (3) leavers, together with (4) special cases and children for (5) re-inspection. All children wearing glasses come under notice, and myopic children with 5 dioptics or more correction are seen by the school oculist. An inspection of sanitary conveniences of the school, the playground, children doing physical exercises and the assembled school completes the observation. The "mass inspection" is said to be an excellent complement to the examination of individual children. Members of the staff are urged to confer with the head teacher before leaving the school after completing an inspection.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Fertility Rates East and West— Farm women are 50 per cent more fertile than city women in the east and 75 per cent more so in the west. Many interesting speculations are suggested in this paper.

BERRY, K. Differential Fertility According to the Geographic Areas in the United States. *Milbank Quart. Bull.*, 9, 3: 79 (July), 1931.

State Pneumonia Study—The details are given of a five-year plan to facilitate early and general use of concentrated serum, and to devise methods for the treatment and prevention of pneumonia in Massachusetts.

BIGELOW, G. H. The Serum Treatment of Pneumonia. *New England J. Med.*, 205, 5: 242 (July 30), 1931.

Health Examination Technic—Principles are set forth by which the general physical examination may be given sufficient accuracy to serve as a scientific instrument.

BRITTEN, R. H. The Physical Examination as an Instrument of Research. *Pub. Health Rep.*, 46, 29: 1671 (July 17), 1931.

Rural School Ventilation—Minor respiratory illnesses which show a marked climatic variability in incidence are also affected by over-heating or over-chilling of the rural school rooms studied.

COLE, R., *et al.* A Study of Rural School Ventilation in Cattaraugus County, New York. *Am. J. Hyg.*, 14, 1: 49 (July), 1931.

Nurses and Nutrition—An effort to simplify nutrition teaching so that each nurse may offer a constructive program when it is needed.

GRANT, E. O., and FISHER, R. W. A Nutrition Program in a Public Health Associa-

tion. *Pub. Health Nurse*, 23, 7: 326 (July), 1931.

Toxoid in Infancy—Successful experience with the prophylactic use of diphtheria toxoid is reported in a group of children from 4 days to 2 years of age.

GREENGARD, J. Diphtheria Toxoid (Diphtheria Anatoxin-Ramon) in Infancy. *J. A. M. A.*, 97, 4: 228 (July 25), 1931.

Minor Ailments in Industry—A British hygienist's summary of the importance of so-called inconsequential illnesses as reflected in industrial output is abstracted in this leading article in a newcomer in the field of industrial hygiene.

HAYLOCK, G. A. Minor Ailments and Production. *Indust. Health Digest*, 1, 3: 1 (July), 1931.

Tuberculosis Case-Finding—The opportunities for detecting cases of tuberculosis which are always before the public health nurse are pointed out in two separate articles on case-finding and its technic.

JACOBS, P. P., and HODGSON, N. H. Case-Finding in Tuberculosis. *Pub. Health Nurse*, 23, 7: 320 (July), 1931.

High-Fat Hot Weather Diets—The injurious effects of an experimental diet high in vegetable fats, which were most marked at 30° C., were not noted or were only slight in animals maintained at 20° C.

KLIGLER, I. J., *et al.* Studies on the Effect of Environmental Factors on the Animal Organism. *Am. J. Hyg.*, 14, 1: 38 (July), 1931.

All About Malaria—Mosquito breeding control, screening, and treat-

ment of patients are discussed in this inclusive symposium.

LEPRINCE, J., *et al.* Symposium on Malaria. South. M. J., 24, 5: 407 (May), 1931.

Syphilis Control—The proposed state-wide program includes full-time county and city health administration, laboratory service, free arsenicals, public treatment facilities competently directed, and educational measures. With such facilities eventual success may be anticipated.

PARRAN, T. The Eradication of Syphilis as a Practical Public Health Objective. J. A. M. A., 97, 2: 73 (July 11), 1931.

Communicable Disease Nursing—One of the goals of public health nursing should be the education of mothers to prevent the exposure of their children to the communicable diseases. How much effort can be spared to this end is discussed in this excellent paper.

REEVE, I. Communicable Disease Aspect of Public Health Nursing. Pub. Health Nurse, 23, 7: 307 (July), 1931.

Immunization Results—Clear cut indeed are the results of a 3½-year experience in the testing and immunization of contagious disease nurses against

diphtheria and scarlet fever. Toxoid proved a more potent prophylactic agent than toxin-antitoxin mixture, and ricinoleated scarlet fever antigen was found to be disappointing in its results.

RHOADS, P. S. Skin Tests and Immunization Against Scarlet Fever and Diphtheria. J. A. M. A., 97, 3: 153 (July 18), 1931.

Efficiency of Toxoid Immunization—Canadian experience is recorded in support of toxoid as the prophylactic agent of choice which can be given without reactions if susceptible children are excluded following the test.

ROSS, N. A., and MCKINNAN, N. E. The Efficiency of Toxoid in Controlling Diphtheria. Canad. Pub. Health J., 22, 7: 333 (July), 1931.

Nationality and Adult Death Rates—Will the change in the nationality of the predominating immigrants from Irish and German stocks, with high death rates in the late age periods, to the southern Europeans, with lower rates, affect the increasing adult American death rates? An answer is found in this study.

WINSLOW, C.-E. A., and WANG, P. L. The Relation Between Changes in Nationality Stock and Increasing Death Rates in Adult Life. Am. J. Hyg., 14, 1: 79 (July), 1931.

BOOKS RECEIVED

THE FIRST TWO YEARS. A Study of Twenty-Five Babies. By Mary M. Shirley. Minneapolis: University of Minnesota Press, 1931. 227 pp. Price, \$2.00.

DIETARY SUGGESTIONS. By C. D. Christie, A. J. Beams and E. M. Geraghty. Chicago: American Medical Association, 1931. 156 pp. Price, \$1.50.

HERE'S HEALTH. By Morris M. Brill. New York: Dial Press, 1931. 120 pp. Price, \$1.50.

THE ESSENTIALS OF SWIMMING POOL SANITATION. By C. A. Scott. Chicago: Lightner Pub. Corp., 1931. 126 pp. Price, \$1.00.

PREVENTIVE MANAGEMENT: MENTAL HYGIENE IN INDUSTRY. Edited by Henry B. Elkind.

New York: Forbes Pub. Co., 1931. 234 pp. Price, \$3.00.

ESSAYS ON POPULATION. By James A. Field. Chicago: University of Chicago Press, 1931. 440 pp. Price, \$3.50.

HEALTH HORIZONS. Compiled by Jean Broadhurst and Marion Olive Lerrigo. Newark: Silver, Burdett, 1931. 516 pp. Price, \$3.00.

EYE, EAR, NOSE AND THROAT MANUAL FOR NURSES. (2d ed.) By Roy H. Parkinson. St. Louis: Mosby, 1931. 223 pp. Price, \$2.25.

COMMUNICABLE DISEASE CONTROL. Report of the Committee on Communicable Disease Control. New York: Century, 1931. 243 pp. Price, \$2.25.

NEWS FROM THE FIELD

LEONARD WOOD MEMORIAL LEPROSY WORK

THE Board of Directors of the Leonard Wood Memorial announces at this time the completion of its fund for \$2,000,000. It takes this opportunity of expressing its sincere thanks to each of the 50,000 American citizens who by their contributions have made possible this great American Foundation. The Board further assures the American public that these funds are being disbursed in accordance with the terms of the gifts and with the counsel of scientists experienced in the field of leprosy. It ventures the opinion that the encouraging results in leprosy treatment and the international good will that have already ensued are but forecasts of even greater progress in these respects in the future, and for these reasons believes it not amiss to congratulate all those who by their generosity have seen fit to become partners in this great international enterprise."

"The Leonard Wood Memorial's program of activities is devoted to research, direct and indirect, in the treatment of leprosy. It comprises two main divisions. About one-half million dollars is to be spent for buildings, equipment, and roads in the Philippines; the balance as a semi-endowment to be expended, both principal and interest, over a period of approximately 15 years. . . . One of the most important single items in the Memorial's capital building program, and the largest, was the establishing of a complete new leprosarium at Cebu, on the island of Cebu, nearly 400 miles southeast of Manila. This institution was planned to care for

those suffering from leprosy in its earlier and milder stages."

. . . .

"Another item was to be the establishing of a new skin clinic. The Philippines, like other countries of the Orient, abound in skin diseases. In many instances these represent incipient leprosy. The splendid new white concrete skin clinic built at Cebu by the Memorial is proving a God-send to children with loathsome affections, and is resulting in the detection of many cases of leprosy, and at a stage where the arresting of the disease is almost a certainty." —*Leonard Wood Memorial Booklet*, Metropolitan Tower, New York.

AMERICAN SOCIETY OF CIVIL ENGINEERS

THE Board of Directors of the American Society of Civil Engineers has authorized the appointment of a Committee on Municipal Cleansing. It is proposed that the committee shall consist of 3 members of the American Society of Civil Engineers, but that there shall be added to it a representative also from each of the following: American Society of Mechanical Engineers, the American Medical Association, the American Public Health Association and the American Society of Municipal Engineers.

Dr. Henry F. Vaughan has been appointed to represent the American Public Health Association.

CINCINNATI HEALTH CENTER

AN unsolicited gift of \$10,000 made by the Western and Southern Life Insurance Company makes possible the expansion of its program at the Cincinnati Health Center by the Board of

Health. The money is to be used for the purchase of an X-ray machine and whatever accessories are required, as well as to defray the cost of the services of a part-time expert X-ray operator.

EUGENICS

THE Third International Congress of Eugenics will be held in New York, during the summer of 1932.

DRESDEN LOAN EXHIBIT AT LIFE EXTENSION INSTITUTE

AN unusual and interesting collection of graphic charts and anatomical specimens from the famous Museum of Hygiene of Dresden has been loaned by the Museum to the Life Extension Institute and is on exhibition at the Head Office in New York.

This world-renowned Dresden museum is devoted to the instruction of the general public in the conservation of health. In 1911 the First International Hygiene Exhibition was held in Dresden which proved to be so successful that its founders and sponsors coöperated in the establishment of the museum as a permanent institution. Since its organization it has attracted millions of people from all parts of the world and is the gathering place of hundreds of international scientific associations. The health and hygiene sections of the League of Nations meet here regularly. In its beautiful and spacious buildings it has assembled in a vivid and interesting manner everything that is of significance to the health of the people.

The anatomical specimens included in the loan exhibit to the institute have been prepared by a special process which renders them translucent, making possible complete visualization of the underlying vascular and bony structures. These specimens are creating particular interest.

The Institute cordially invites all who may be interested to call and view this unique exhibit.

TO OPEN HOSPITAL NEAR ARCTIC CIRCLE
BISHOP TURQUOTIL, a pioneer missionary in the north country who is known as the "Bishop of the Arctic," left Churchill, Man., in July with 4 nurses, members of the Grey Nuns, in his 25-foot motor boat on the hazardous trip along the rocky west coast of Hudson Bay to open a hospital at Chesterfield Inlet. This will be the farthest north hospital on this continent.

The hospital will serve the nomadic Eskimos and the hunters and prospectors that search for fur and gold on the fringe of the Arctic Circle. Education courses in hygiene will be given to the Eskimo children by the 4 sisters.

TREATMENT FOR BLIND CHILDREN WITH CONGENITAL SYPHILIS

AS a result of the examinations conducted by the Virginia State Health Department in the School for the Deaf and Blind, and the subsequent examinations conducted by Dr. J. E. Blaydes of Bluefield this year, many blind children have been placed under treatment for congenital syphilis. The Bureau of Venereal Diseases is providing the drugs and arranging with private physicians in communities wherein the children reside for administering the treatment.

CHILDREN'S ACCIDENTS

MORE than 18,000 children in the United States were killed by accidents in 1930, and a very large number were seriously injured. Yet these startling figures represented a considerable decrease in accidental deaths of children, especially those of school age, according to the supervisor of New York City's child-safety demonstration. He found that low intelligence, worry, weariness, day-dreaming, love of adventure, and rebellion against authority are among the mental causes of accidents, and he suggests that parents and teachers should take them into con-

sideration in the training of children.—
U. S. Children's Bureau, Washington,
D. C.

DR. PETER LECTURES AT CHINESE MEDICAL SCHOOLS

DR. W. W. PETER, F. A. P. H. A., has been lecturing in the Central University Medical School and at Nanking University, and has given a course in industrial hygiene in Shanghai conducted jointly by the Chinese National Health Administration and the Ministry of Industries, in a school for the training of factory inspectors for the various provinces and larger municipalities.

PARIS MEETING ON TUBERCULOSIS

THE annual meeting of the Council of the International Union against Tuberculosis, whose Chairman is Professor Frölich (Norway), was held in Paris July 9; delegates from 17 countries attended this meeting.

The scientific session was held at the Pasteur Institute, in the new tuberculosis laboratories which the members of the Council visited under the guidance of Professor Calmette.

The next Conference of the International Union will be held at The Hague from September 6 to 9, 1932.

NATIONAL SAFETY COUNCIL

AS the teaching of safety becomes more general, and the quality of the work improves, there is an increasing need for pooling experiences, and giving publicity to approved and effective methods. As a result the National Safety Council has organized a Child Education Section corresponding to the other sections of the Council dealing with industrial and public safety problems.

The first meeting of the Child Education Section will be held in connection with the Twentieth Annual Safety Con-

gress to be held in Chicago October 12-16.

HEALTH DEPARTMENT SURVEY

DR. JOSEPH W. MOUNTIN, member of the A. P. H. A., recently began a survey for the U. S. Public Health Service of the Baltimore City Health Department, at the request of Dr. Charles Hampson Jones, Commissioner of Health of Baltimore. It will include an attempt to define the boundaries between public health work and private medical practice; will cover sanitation, vital statistics, communicable disease control, child and maternal hygiene, industrial and mental hygiene, hospital facilities and activities of welfare agencies. He recently made surveys of the Health Departments of the State of Tennessee and the cities of Knoxville, Tenn., and Wilkes-Barre, Pa.

PERSONALS

DR. CLARENCE L. SCAMMAN, F.A.P.H.A., of Boston, formerly deputy commissioner of public health of Massachusetts and director of the division of communicable diseases, has become director of the division of public health of the Commonwealth Fund of New York.

DR. WALTER W. LEE, F.A.P.H.A., has been appointed District State Health Officer in the Berkshire district of Massachusetts, succeeding Dr. Frederick S. Leeder, who has a similar position in the Southern Berkshire Health District.

DR. E. H. PADDEN has been appointed Flight Surgeon for the three airways of the United Air Lines west of Chicago. These include Boeing Air Transport, between Chicago and San Francisco; Pacific Air Transport, between Seattle and San Diego; and Varney Air Lines, between Salt Lake City and Seattle.

DR. FREDERICK RAND ROGERS, Director of the Health and Physical Education Division of the University of the State of New York, will leave the department September 1 to become dean of student health and physical education at Boston University.

HUNTINGTON WILLIAMS, M.D., D.P.H., of the New York State Department of Health, Life Member of the American Public Health Association, has been appointed Director of Health of Baltimore, Md., by Mayor Howard W. Jackson of Baltimore.

RECENT APPOINTMENTS in Kentucky include: Dr. Lewis C. Coleman, of Salyersville, to Madison County, succeeding Dr. Harold W. Sterling, who has accepted an appointment in the U. S. Public Health Service; Dr. Robert J. Gillespie, of Long Beach, Miss., to Magoffin County, succeeding Dr. Lewis C. Coleman; Dr. Allen F. Murphy, of Beckley, W. Va., to Lee County; Dr. Squire R. Boggess, of Lawrenceburg, to Anderson County.

DR. JAMES M. PARROTT, of Kinston, N. C., was appointed secretary of the Board of Health and State Health Officer, succeeding the late Dr. Charles O'H. Laughinghouse.

DR. WILLIAM O. McDERMOTT, of Casper, Wyo., was recently appointed Health Officer of Natrona County, succeeding Dr. Homer R. Lathrop.

DR. FRANCES M. LANE, of Cody, Wyo., was recently named Health Officer of Park County, replacing Dr. Frank A. Mills, of Powell, Wyo.

DR. ADELAIDE BROWN, F.A.P.H.A., of San Francisco, has resigned from her office in the California State Board of Health, with which she was connected for over ten years.

ELLSWORTH L. FILBY, F.A.P.H.A., has resigned as Chief Engineer and Director of the Bureau of Engineering, Florida State Board of Health, to become a member of the staff of Black

& Veatch, Consulting Engineers of Kansas City, Mo.

CONFERENCES

September 14-17, Sixtieth Annual Meeting, American Public Health Association, Montreal, Canada.

September 20-26, First National Congress on Social Service for Children in Argentina, under the auspices of the National Council of Women of Argentina, Buenos Aires, Argentina.

September 20-26, Medical Association of South Africa, Johannesburg, South Africa.

September 23-30, Centenary Meeting of the British Association for the Advancement of Science, London.

September 25-28, American Protestant Hospital Association, Toronto, Ont.

September 28, Children's Hospital Association, Toronto, Ont.

September 28-October 2, American Hospital Association, Toronto, Ont.

September 28-October 2, American Occupational Therapy Association, Toronto, Ont.

October 12-16, Twentieth Annual Safety Congress, Chicago, Ill.

October 19, 20, Conference of the Child Study Association, New York, N. Y.

October 22, 23, Seventh Annual Meeting of the Missouri Water and Sewerage Conference, Jefferson City, Mo.

November 9-14, the Ninth Texas Sanitarians' Short School, Houston, Tex.

July, 1932, The Second International Conference of Social Work, Frankfurt, Germany.

SELF-INFECTION DURING COLDS

avoided through use of
KLEENEX TISSUES
in place of handkerchiefs

American Journal of Public Health

and THE NATION'S HEALTH Vol XIII No 10

Volume XXI

October, 1931

Number 10

Training for the Public Health Engineer*

S. C. PRESCOTT, F. A. P. H. A.

Massachusetts Institute of Technology, Cambridge, Mass.

A HUNDRED years ago there were but two types of engineers—"military" engineers, whose activities were concerned with operations of warfare and defense, and "civil" engineers who dealt primarily with the varied problems of civil life and of the industries which developed therefrom.

In contrast with such a simplicity of designation, we recognize that today there are many kinds or varieties of engineers, some of highly specialized training and restricted to a narrow field of professional activity, others concerned with broader and more general aspects of present-day problems. One fact stands out boldly to characterize the work of all these men and to define their status as a group: *They are all dealing in some manner with the materials, forces or phenomena of nature, and utilizing or controlling them for the advancement of the interests of man.* Thus we may define the function of the engineer in a broad sense.

The great differentiation mentioned has obviously come about as a result of the rapid growth or extension of scientific knowledge, and the practical detailed application of the facts and principles of science to the methods and manifold procedures of production, manufacture, transportation, communication, illumination, and other agencies of modification or control of environmental conditions, which tend to add to the welfare, convenience, and comfort of mankind. In this diversity of specialized pursuits which has thus been made possible, we now recognize public health engineering as an essential calling, the prime

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 17, 1931.

object of which is to control the factors of the physical environment as they especially affect the health and welfare of aggregates of people, whether in small groups, or in cities, states or special areas, or in the nation as a whole.

In order to illustrate more definitely what is meant by the "factors of the physical environment" in the relations specified, let me group the types of problems which may be encountered, and thus indicate in some degree the breadth of preliminary engineering and biological knowledge which this type of engineer should be able to apply in their solution.

1. Water pollution and water supply, comprising methods of analysis and measurement, preliminary investigations of treatment and purification of public water supplies, investigation of streams and harbors pollution, etc.
2. Development of methods of treatment and safe disposal of sewage and other fluid wastes of urban communities and of industrial plants
3. Refuse collection and disposal including possible utilization of by-products
4. The control of insects and vermin—including drainage and reclamation of marshy districts infested by mosquitoes or other pests; fly control, rodent control, etc.
5. Ventilation and air hygiene—including dusts, odors, and gases
6. Special problems of housing and town planning, including congestion, street cleaning, and smoke and noise nuisances
7. Sanitary production, transportation, handling and control of city milk, shellfish, and other food supplies
8. Industrial hygiene and special health hazards in trades and industries
9. Sanitation of playgrounds and swimming pools, bathing beaches, tourist camps, roadside stands, etc.
10. The general problems of public health administration and organization, and coördination with the more specific aspects of epidemiology, infection and immunity and communicable disease control

It will, I believe, be readily recognized that each of the foregoing types of problems demands for its solution comprehension and accurate knowledge of the causative agents of disease and of factors in personal health, and at the same time gives opportunity for the application of engineering knowledge and principles. However, it will be noted that I have not emphasized problems incident to the final design and *construction* of great installations for metropolitan water supplies, or sewage disposal works, since I believe this comes properly within the field of activity of the civil or sanitary engineer. Obviously, the training of the public health engineer should not neglect serious work in this field; in fact, he should have a solid grounding in it on which he can safely expand and develop if he so desires. But I have intended to empha-

size the problems in which the engineering procedures incident to their solution are intimately related to or dependent upon the proper application of basic principles of bacteriology, chemistry, and sanitary science and of personal hygiene. This point of view seems to be in line with the position taken by the Sub-committee on Nomenclature, appointed (in December, 1930) by and reporting to the Committee on Training and Personnel of this Association which has set up a definition of the Public Health Engineer in the following terms:

A public health engineer is a graduate of a reputable engineering school, college, or university, who has received substantial training in the sanitation of the environment. Satisfactory training in this professional field (either undergraduate or through graduate study) includes such instruction in the fields of sanitary engineering, chemistry, bacteriology, biology and administrative methods, as is necessary to provide a thorough knowledge of the theory and practice of water purification, waste disposal, milk and food control, the destruction of the vectors of infection, and the conduct of health department activities in the field of sanitation.

The same report defines a sanitary engineer as

... a graduate of a recognized engineering school who is skilled in the design, construction and operation of water and sewage purification plants and in the conduct of engineering activities relating to the public health.

It is obvious that any general definition of a special professional field is subject to minor criticism or to differences in interpretation by those whose chief activities lie within the broad zone that is indicated in the inclusive phrase "activities relating to public health," but I think there will be little doubt as to the general soundness of the differentiation which has been suggested. A study of courses in sanitary engineering given at those educational institutions which have offered them, shows that in most or all cases they have been largely modified courses in civil engineering, with a relatively small amount of time given to the broad aspects of public health problems aside from water and sewage.

The contribution which engineering has made to public health work in the past 50 years is to my mind one of the strongest arguments for a more broadly conceived basis for coöperation. In this period, the medical man, the sanitary bacteriologist, and the engineer have worked together for the control of certain types of communicable diseases. The result has been the remarkable conquest of water-borne diseases, which, while not complete, is extensive enough to provide the evidence that it is quite within the power of man to reduce them to comparative insignificance, if not entirely to eradicate them. Today in America, cholera is unknown, typhoid fever and dysentery are very greatly re-

duced and declining constantly. This has been largely due to purification and careful control of water supplies and to extension and improvement of sewerage facilities and the development of methods of treating sewage and preventing direct contamination from excreta.

The lowering of the death rate from communicable diseases in general has been due to numerous factors, but to a great extent it has been the result of the securing and maintenance of a better environment through the application of public health engineering. The results which have already been obtained indicate clearly to my mind the desirability of a specialized training in which the principles of chemistry, biology, and bacteriology, and of engineering procedures are combined and coördinated in a logical and consecutive manner and with one common objective. The student who successfully undertakes such a course of discipline may then, I believe, enter upon his professional work equipped to understand and appreciate the character and the magnitude of the problems he is likely to encounter, and to study analytically, in the light of the principles he has learned, the method of attack which is likely to be effective. In other words, he can visualize his problem as a whole, and apply the facts of science to its solution. This may not be as simple as it sounds. Many public health problems are of complex character, involving physical, chemical, and biological phenomena, and necessitating for their solution not only an extensive knowledge of fundamental facts and principles, but a delicacy of judgment and comprehension which is likely to be obtained only by experience.

It is manifestly impossible in the scholastic training of the embryo public health engineer, to provision for him all the situations which he will encounter in actual practice, or even many of them. But it seems to be possible so to impress on him the fundamental principles which are the tools he must constantly use that he can approach his work with a background of scientific fact and intelligence, and confidence in the accuracy of his reasoning as to procedures which must be or may be employed. This should develop in him the ability to translate all the problems or tasks to which he is early assigned into what will become his working capital of public health engineering vision and experience.

We may now inquire more specifically regarding the fundamental and technical training for the student who wishes to become a public health engineer, and which will meet the requirements of the definition which has been suggested.

I wish to present for discussion the program which we have worked out at Massachusetts Institute of Technology. This is a course of 4 years in which, in addition to the regular academic sessions, a con-

siderable part of one summer is used for required work. Our course is planned in accordance with our accepted policy at Technology that the first 2 years' work should be of general and fundamental character, while the upper 2 years are devoted largely to subjects which bear more directly on professional attainment. It is also a part of our accepted policy that every engineering or scientific student should have, as a part of his curriculum, required work in English and modern languages, economics, and some informative or cultural courses outside his professional field.

It is obvious that for any student who hopes to gain prominence or effectiveness in science or engineering there must be a solid foundation of mathematics, physics and general chemistry. The student in public health engineering, therefore, has 2 years of calculus and differential equations, 2 years of physics, of which 1 is devoted to theoretical mechanics and 1 to the principles of electricity, optics and heat; a year of general chemistry and another of analytical chemistry. In these years also he received instruction in English, mechanical drawing, and descriptive geometry. The work of the first 2 years is therefore made up largely of subjects which aid in developing straight thinking, analytical reasoning, and the establishment of fundamental scientific principles and methods of expression.

In the second year the student has a broad introductory course in biology, in which, as in the other courses, fundamental principles are emphasized. Applied kinematics follows and further stresses the rigorous course in general and theoretical mechanics.

During the summer following the second year an intensive course of 6 weeks' duration is given in general, topographic and hydrographic surveying, as is a course in limnological field work in which the chemistry, physics, and biology of lakes and streams is presented. Studies on dissolved oxygen, carbon dioxide, temperature and alkalinity measurement, sampling and sanitary surveys, and the microscopic flora and fauna of the waters are among the matters taken up.

The student should now be prepared to enter upon the more specialized subjects on which public health engineering is based. On the public health side these include general bacteriology (considered both from health and engineering aspects); and infection and immunity, bacteriology of water, sewage, and foods, and municipal sanitation; on the purely engineering side, earthwork engineering, hydraulics, structures and strength of materials; in chemistry, organic chemistry, sanitary chemistry and the special methods of analysis of water and sewage. General studies and economics provide subjects of broadening influence or semi-technical significance.

The fourth year program continues the emphasis on public health

and engineering studies. Of the former, we include public health administration, vital and sanitary statistical methods, and a broad course designated as "sanitation" treats of the varied types and aspects of the special public health procedures (which I presented in the early part of this paper) which are not taken up elsewhere. Special emphasis is given to the subjects of drainage, insect control, the problems of milk supply sanitation, pasteurization processes and engineering, etc.; and the sanitary and engineering aspects of refuse and waste disposal, and to those aspects of food production and handling which involve not only a knowledge of bacteriological methods of examination but also may require distinctly engineering treatment.

While not ordinarily regarded as within the purview of the engineer, we believe that it is quite desirable for the public health engineer of the future should have some familiarity with the new processes of food technology which are making such rapid strides. A well organized course in industrial hygiene brings to the student the relations of factory processes and conditions and the health of the worker, and provides a direct avenue toward safety engineering and industrial health and personnel administration. Throughout the year a weekly biological colloquium makes possible practice in the art of preparing and delivering reports and papers of technical character.

On the engineering side, the work in structures is continued and is accompanied by correlated courses in sanitary design, and in hydraulic and sanitary engineering, in which the student is required to make the plans, calculations, and assembled drawings for some type of sanitary construction such as a sewer system, a water filtration or treatment plant, and some other more specialized type of installation of public health significance.

There is required also a course in the mechanical equipment of buildings which includes the consideration of heating, ventilating and humidifying equipment, lighting, plumbing and the other mechanical installations which are essential to the modern factory or business structure. Finally, a considerable portion of the last term of the undergraduate course is devoted to an original investigation of some problem involving bacteriological, administrative, statistical, or structural features which must be worked out by the student himself.

The accompanying program of the course shows the sequence of subjects during the 4 years, and the unit values of the courses presented. Summarized by general subject groupings, we have the following approximate allocation of time required in class work and preparation during the 4 years leading to the degree of Bachelor of Science in Public Health Engineering.

REQUIREMENTS FOR B.S. IN PUBLIC HEALTH ENGINEERING

TOTAL HOURS REQUIRED—6,060

	Hours	Per cent
Mechanical Drawing & Descriptive Geometry	180	3 approx
Military Science and Physical Training	240	4 "
Mathematics	480	8 "
Physics	660	11 "
Chemistry	915	15 "
English, Economics and General Studies	870	14 "
Biology and Public Health	1185	20 "
Engineering Studies	1530	25 "

It will be seen from the above arrangement that approximately 55 per cent of the time of the student is devoted to what may be regarded as general, fundamental, or cultural studies, and that these include subjects which are calculated to develop his accuracy and power of analytical thought as well as to give him the broad basis of general knowledge and human interest which must be a part of every educated man and which is especially demanded of the engineer whose future is to be devoted especially to problems of social and community significance.

We believe also that the suggested program is sound from the professional standpoint and supplies an adequate foundation on which a man may build his career and from which he may enter the administrative, the structural, or the consulting field, depending upon his natural aptitudes, ambitions, and opportunities.

BIOLOGY AND PUBLIC HEALTH

OPTION 3. PUBLIC HEALTH ENGINEERING

FIRST YEAR—SAME FOR ALL STUDENTS

Second Year

First Term	Hours per Week	Second Term	Hours per Week
Qualitative Analysis	7-2	Applied Mechanics	3-5
Biology, General	5-2	Quantitative Analysis	7-2
Physics	5-5	Physics	6-4
English & History	3-5	English & History	3-5
Calculus	3-6	Differential Equations	3-6
Military Science	3-0	Military Science	3-0
General Study	2-2		
			25-22
Units of exercise & preparation	28-22		

Required during Summer 1931. At Camp Technology

Surveying	12-1
Hydrographic Survey	5-0
Limnological Field Work	5-0

Third Year

	Hours per Week		Hours per Week
Railway & Highway Eng.	1-3	Railway & Highway Eng.	2-2
Applied Mechanics	3-6	Structures	3-5
Organic Chemistry	4-3	Hydraulics	3-5
Personal Hygiene & Nutr.	2-2	Chem. of Water & Sewage	4-1
Bacteriology	6-4	Bacteriology	6-3
Political Economy	3-3	Municipal Sanitation	4-4
General Study	4-4	Political Economy	3-3
	<hr/>		<hr/>
	23-25		25-23

Fourth Year

	Hours per Week		Hours per Week
Structures	4-8	Sanitary Engineering	3-4
Hydraulic & San. Engr.	4-5	Sanitary Design	6-0
Sanitary Design	4-0	Mech. Equip. & Build.	4-3
Public Health Admin.	2-3	Industrial Hygiene	4-4
Vital Statistics	2-3	Public Health Admin.	2-3
Sanitation	6-2	Biological Colloquium	1-1
Biological Colloquium	1-1	General Study	2-2
General Study	2-2	Thesis	10
	<hr/>		<hr/>
	25-24		49

New Plan Sought for Transporting Malaria Cultures

AN improved method for transporting malaria cultures for treatment of victims of paresis (general paralysis of the insane) is being sought at the new U. S. Public Health Service investigation station at Columbia, S. C.

At present, the only certain way of transporting the infection is by live mosquitoes, which must be accompanied by attendants.

The work is being done at the State Hospital for the Insane, which was selected as the place for cultivation of these mosquitoes for distribution throughout the United States.

A great deal of the present expense in distributing malarial infections for paresis treatments would be eliminated, however, if a way could be found to ship only the live malaria cultures.

Laboratory facilities, which were obtained through the coöperation of Dr. C. F. Williams, Superintendent of the State Hospital, are ideal for the work now being carried on. The location is near a malarial district, where the "anopheles larva," the young malarial mosquito, is captured in the water.

Also, after the mosquitoes are hatched in the laboratory, it is not difficult to obtain malarial patients who will allow the mosquitoes to contract the infection from them.

Dr. James A. Hayne, State Health Officer of South Carolina, and his coworkers are helping the Service in this work.—*U. S. Daily*, Aug. 26, 1931.

Training of Health Department Personnel*

JOHN A. FERRELL, M. D., DR. P. H., F. A. P. H. A.

*Associate Director, The Rockefeller Foundation, International Health Division,
New York, N. Y.*

THE personnel requirements of health departments vary with their character, function, and size. State health departments as a rule are composed of functional divisions, each having a staff of specialists who should be qualified to supply expert consultant service to the state health officer and also to local health officers and their associates who compose the field staffs of town and county health departments. The state departments and their divisions usually do not undertake to supply health service directly in the home, the school, or the clinic, except when their aid is requested by the local health departments.

The customary divisions of the state department are: administration, laboratory procedures, epidemiology, vital statistics, sanitary engineering, and public health nursing. Some state health departments include also divisions for special diseases, such as tuberculosis, venereal diseases, cancer; divisions for special varieties of hygiene, such as maternal, infant, preschool, school, adult, oral, mental, or industrial hygiene; and divisions for special fields, such as food and drugs, inspection of state institutions, etc. Specialists are employed for service in the various divisions—one or more in each. Thus the training requirements for state health personnel are technical and varied. The specialist type of personnel predominates.

Local health departments of towns and counties are mainly engaged in supplying the people with information and service regarding health and the prevention and control of disease. The service is carried directly to homes, schools, and clinics. The staffs are composed mainly of medical officers of health, public health nurses, and sanitary inspectors. These emissaries of health interpret scientific knowledge to the masses. They are the teachers in the public health field. They should be broadly trained in public health subjects, and each should possess special training for his or her branch of service; but they are not expected to be technical experts to the degree that is

* Read before the Western Branch, American Public Health Association, at its Second Annual Meeting in Seattle, Wash., May 30, 1931.

essential for the specialist in the functional divisions of state health departments. The town and county health departments usually have limited resources. They are engaged in community, school, and home service. They rely usually upon the state health department personnel when problems arise requiring the aid and guidance of the technical expert. With few exceptions, the technical expert is not an employee of the town and county health departments. The chief requirement for personnel of these departments is for the field worker to carry on routine health measures.

Until recently the impression prevailed generally that any physician, or graduate bedside nurse, was qualified for local health work. In responsible circles, this is now known to be wrong. Public health service is itself a specialty, for which specific knowledge and training are necessary. University schools have been established to supply such training, and some of them have access to facilities for supplementing the intramural instruction with practice and instruction in the field.

The health departments of large cities combine into one organization the group of specialists, who typify the state organization, and the field workers, who typify the town and county unit. The cities have wealth, large populations, large budgets, and complex problems. They have or should have the laboratory, statistical, communicable disease, engineering, and other special services, as do the state health departments; and also the school, home, clinical, and community services, as do county and town organizations. Their requirements call for workers of every type.

TRAINING THE TECHNICAL EXPERTS IN PUBLIC HEALTH

Universities in the United States, Canada, and other countries, are now offering courses of training for public health specialists. Excellent courses in sanitary engineering are given by a number of institutions, such as Massachusetts Institute of Technology, Harvard and Johns Hopkins Universities, and a few state universities. At least 16 institutions in the United States (most of them universities) are giving courses in public health nursing which the National Organization for Public Health Nursing approves. (Every Pacific Coast state university is on the list.) They are as follows:

Department of Hygiene, University of California, Berkeley, Calif.

School of Public Health Nursing, Simmons College, Boston, Mass.

University of Michigan, Ann Arbor, Mich.

Washington University, St. Louis, Mo.

Department of Public Health, University of Minnesota, Minneapolis, Minn.

Department of Nursing Education, Teachers College, Columbia University,
New York, N. Y.

School of Applied Social Sciences, Western Reserve University, Cleveland, O.

School of Social Work, University of Oregon, Portland, Ore.

Pennsylvania School of Social and Health Work, Philadelphia, Pa.

Department of Nursing Education, George Peabody College for Teachers,
Nashville, Tenn.

Richmond School of Social Work and Public Health, Richmond, Va.

College of Science, Department of Nursing, University of Washington, Seattle,
Wash.

Vanderbilt University, Nashville, Tenn.

Department of Nursing Education, Detroit City College, Detroit, Mich.

Department of Public Health Nursing, Syracuse University, Syracuse, N. Y.

Department of Social and Health Work, Fordham University, New York, N. Y.

Fifteen universities in Canada and the United States are listed in the report of the Committee on Training and Personnel of the American Public Health Association as having schools or courses in public health.¹ A few of the universities listed also have schools or courses in sanitary engineering and in public health nursing.

These schools of public health, certainly the larger and more heavily endowed ones, give courses suitable for the training of all, or certainly the majority, of the technical experts needed in city and state health departments. Epidemiology, bacteriology, immunology, vital statistics, sanitary chemistry, physiological, industrial, and other types of hygiene, and public health administration are among the courses offered. The situation generally with regard to the technical or specialized personnel is not bad. The majority of the appointees have taken special training for their work, but there are too many who have not. For example, the percentage of the vital statisticians who have had special training is small. Moreover, all too many divisions of communicable diseases are manned by physicians who have had no special training in epidemiology, or in diagnosing, clinically or by laboratory methods, the various communicable diseases.

In certain localities public health administration is unsatisfactory. The impression has been common that almost any doctor could qualify as a public health administrator, even though he had no special training or experience in the public health field. Some of the self-styled experts in the field of government administration contend that all branches of governmental service must be subject to political parties and changing administration; that health departments must have executive heads who will rise and fall with the administration; and that deputies and division heads may be continued, if it pleases the political head to retain them. It seems to me that professional administrative

leadership in deciding upon policies, principles, personnel, and procedures is vital, and any plan which fails to secure and retain such leadership weakens the health service.

Among our governmental institutions, our state universities stand out for quality and stability; and this is due, I believe, to a plan of organization which to a large degree frees them from political domination. The public health administrator should be classed with the specialists and should have general training in the various fields served, and also experience in city or county health organizations. It is not to be expected that the administrator will demand desirable qualifications for his appointees, if his own training is quite limited.

TRAINING PERSONNEL FOR LOCAL HEALTH SERVICE

As stated above, medical officers of health, public health nurses, and sanitary officers compose the staffs of health organizations of towns and counties, and constitute an important part of city health organizations. The schools of public health listed in Table I of the report¹ as a rule offer courses suitable for local health officers. Likewise, the schools of public health nursing offer courses suitable for the field nurse. It is my impression that there are no university courses offered for sanitary inspectors, with the possible exception of a course at the University of Tennessee at Knoxville. Information as to the number of local health officers and public health nurses who have taken university courses in public health is not available, but the percentage is extremely small.

In England, where public health work is much older than in this country, and where, in general, compensation and tenure of office are more attractive, qualifications have been established for field workers in public health, a reserve of candidates for positions is available, and the qualification standards are enforced. In our country the conditions of service have not been stabilized; there is no reserve of trained candidates for the positions; and the demand for workers has consistently exceeded the supply. Consequently, qualification standards based upon special training and successful experience have not been generally adopted, and, where adopted, have not been rigidly enforced. Although it is highly desirable that the appointees in local health positions should have had university training in public health, and most of the institutions listed are prepared to give suitable training, it has been impossible in the past to secure enough personnel that has had such training.

A few of the more progressive state health officers are encouraging and even aiding their capable young officers and nurses to take uni-

versity courses, and although they have been unable to rely on the universities to supply their personnel needs, they are at least endeavoring to get away from the old plan of depending almost solely on the school of experience. It is still the practice in a number of states to select physicians and graduate nurses without special training in public health and expect them gradually to become proficient. Although some of our most capable health workers have been developed by this method, it has in general been found wasteful and inefficient.

Although experience is invaluable and there is no real substitute for it, it should be supplemented by thorough university training. While ultimately it may be possible, as already seems to be the case in England, to enforce standards of training in filling vacancies in local health organizations, there will be a transitional period of several years from the school of experience to the university training stage, during which the state and city health departments will find it necessary to supply short, intensive courses of practical training to their new appointees. The situation has been recognized by some of the more progressive state health officers, and stations have been established where this type of training is provided and where the candidates are appraised for positions. The teaching staff is carefully selected and consists, as a rule, of a medical health officer, a public health nurse, and a sanitary engineer or sanitary inspector, all of whom have had special training in public health and usually would be regarded as eligible for a faculty status in university groups.

The plan of operation varies somewhat. All of the instruction and field practice may be given in connection with a highly organized county health department, or the lecture and demonstration work may be given in the state health department quarters, or at the university, and the field work in nearby local health departments. Customarily the technical staffs of the state health departments give some of the lectures and demonstrations. The training offered is intended to be elementary and practical and in no sense a substitute for university courses.

Training of this character has been available since 1922 in Alabama, 1927 in Mississippi, and 1928 in Michigan. It was also available in Ohio during the period 1927-1929, inclusive. In Tennessee 3-month courses for health officers have been offered 2 or 3 times a year since 1928, through the coöperation of the State Health Department, the Department of Preventive Medicine of Vanderbilt University Medical School at Nashville, and nearby local health departments. The Nashville station has been limited to training for medical health officers; and the one in Michigan to the training of health officers and

nurses; whereas the stations in Alabama, Mississippi, and Ohio have received health officers, nurses, and inspectors. The station established by the Missouri State Board of Health receives nurses only. The Los Angeles County Health Department has given courses of from 2 to 4 months' duration for sanitary inspectors.

Many of the persons admitted to these stations have, in the course of their training, been carefully appraised as to suitability for positions. A number have been found unsuited to public health work and have not been given appointments. Where training stations admit health officers, nurses, and inspectors to the training, the workers become acquainted with each other and learn something of the fields of activity for which each group is best qualified, and thus understanding and the spirit of team-play are developed. The state health officers who have employed persons trained at these stations have been well pleased with the results; the service in the various branches of the health departments has been more efficient than in the past; the taxpayers have been more favorably impressed than was the case when inexperienced and untested workers were employed; and the percentage of failures of health departments has been much lower.

A canvass as to the sources from which schools of public health derive their students indicates that health departments utilizing training stations are also the ones as a rule which are gradually having increased representatives among the students in the schools of public health. Experience tends to show that the training stations are complementary and supplementary to the schools of public health and that they are in no sense competitive. If in due course the schools of public health should turn out a sufficient number of trained workers to fill the vacancies in health departments, the training stations could be discontinued, but either the schools of public health or the state health departments will find it necessary to make permanent provision for practical training for appointees who have had school of public health training. Until college courses in public health are available for sanitary inspectors, the city and state health departments will find it necessary to provide practical training for them. The salaries available for these workers, like those for health officers and nurses, are generally so low that the incentive for taking extensive training is lacking. Until the condition improves, it will be necessary for health departments and coöperating voluntary health agencies to give financial assistance to health workers to take training, not only to those attending university courses in public health, but also to those taking short intensive instruction at training stations.

A few of the health departments have made a beginning in this

direction by allowing study leave with full or part pay during the period of training. School of public health courses cost from \$1,500 to more than \$2,000 per school year, whereas attendance at field training stations requires from \$3 to \$5 a day for meals and lodging and provision for travel. In general, it must be admitted that the situation with regard to the training of health department personnel is unsatisfactory, and that the public health executives and the health workers have not been sufficiently concerned.

Now that university courses are available for training technical experts, medical officers of health, and public health nurses; and no doubt before long will be available for sanitary inspectors; and that health workers, to an increasing degree, are recognizing the necessity for public health training; the outlook may be regarded as encouraging. Moreover, as a number of the more progressive health officers, finding themselves unable to secure university-trained personnel, are making provision for and demanding at least a few weeks of training and experience under competent instructors as a condition of appointment, rendering it unnecessary to accept workers with no training, the outlook is hopeful.

But the transition is needlessly slow. Health executives, health workers, legislators, and taxpayers should be educated as rapidly as possible concerning the need of employing only trained health personnel. Qualification standards for personnel cannot be rigidly enforced, however, until the supply of trained workers approximates the demand. No phase of public health work is more important than raising the eligibility standards for appointment, and this in turn will have to go hand in hand with placing public health work on a professional basis, reasonably free from political interference, and on a plane where compensation and security of tenure will compare favorably with the prevailing standards in other attractive professions.

SUMMARY

1. Health department personnel requirements call for technically trained experts, such as public health administrators, statisticians, epidemiologists, bacteriologists, immunologists, sanitary engineers, public health nurses, etc., for service in state and city health departments.
2. For town, county, and city health departments, health officers, public health nurses, and sanitary inspectors are required.
3. University courses in special schools or schools of public health are available for the training of technical experts and, as a rule, fair standards of training have been established. For local health service, the university schools of public health and public health nursing offer suitable courses for health officers and nurses, but not for sanitary inspectors.

4. The supply of local health workers furnished by the schools of public health is extremely small and so woefully inadequate that state health departments have been forced to develop training stations where intensive instruction and field experience can be given. These training stations are intended to serve only during a transitional period until the schools of public health can meet the demand in so far as scientific instruction is concerned. They may be needed permanently to supplement the university training by functioning as practise schools.

5. The situation with regard to trained personnel is steadily improving, but progress is needlessly slow; consequently the health authorities and others interested should take measures to stimulate more rapid development.

REFERENCE

1. Report of the Committee on Training and Personnel for 1930, *A. J. P. H.*, 21, 6: 653 (June), 1931.

Milbank Memorial Fund

ACCORDING to the report of the twenty-sixth year of work of the Milbank Memorial Fund of New York, this institution appropriated a total sum of \$1,436,913.83 last year for distribution among 25 health and social welfare organizations, in addition to \$230,251.12 paid on grants of previous years. This represents an increase of \$680,913 over the Fund's appropriations in 1929. Pledges from income amounted to \$686,425.83, while a total of \$750,000 was appropriated from principal. Actual payments on these pledges in 1930, together with payments on grants of previous years, reached a total of \$1,098,059.95.

Since its foundation in 1905 by Mrs. Elizabeth Milbank Anderson, the Milbank Memorial Fund has expended \$7,506,900 in philanthropic work, chiefly through grants to 136 organizations in the fields of health, social welfare and education. The Fund's activities in recent years have been largely confined to public health education and administration, chiefly in connection with the New York Health Demonstrations carried on in Cattaraugus County, N. Y., Syracuse, N. Y., and the Bellevue-Yorkville section of the City of New York. The more noteworthy, therefore, were the organization's grants of \$607,250 during the past year for social welfare. They represent the largest commitments in this field which the foundation has ever made in one year, comparing with \$27,728.53 in 1929, and \$188,298.32 in 1920, the previous record year. Public health, it is recognized, is now so linked up with social and economic questions that it cannot very well be separated from these broader fields.

Sanitary Control of Shellfish in the State of Washington*

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THE shellfish industry in the State of Washington is extensive since there are many sheltered bays and inlets in which cultivation can be successfully carried on, and wherein natural beds exist.

The shellfish of economic importance are oysters, clams and scallops. The oysters are of two distinct types, the small Olympia or native, and the large Pacific or Japanese, lately introduced through importation of seed from Japan. The clams are known as the razor, butter, and little neck varieties. The scallops are of a typical west coast species.

The marketable oysters are entirely of cultivated stock since the natural beds in this region, as elsewhere, have been depleted or have disappeared from other causes. The clams and scallops occur entirely in natural beds over a wide territory. All these shellfish are marketed in a fresh or raw state. Razor and butter clams as well as a few of the Pacific oysters are canned.

The oyster beds are in shallow bays and inlets usually close to the shore line. The practice of diking to avoid continual exposure at low tide is a feature not observed in eastern waters where the oyster beds are not usually exposed during such periods. The Pacific clam beds are on beaches along the shore line and not on detached flats as is often the case on the Atlantic coast. The scallops are found in relatively deep waters in the Puget Sound region.

There are 4 distinct oyster producing regions in this state, the Olympia area, an extensive network of inlets and bays, Hood Canal, Samish Bay and Willapa Bay. The clam beds are scattered over the same area as well as along the beaches of the Pacific Ocean.

During the year 1924 preliminary observations toward the sanitary control of shellfish in Washington were made by Dr. A. U. Simpson, Epidemiologist of the State Department of Health. In 1926, the

* Read before the Western Branch, American Public Health Association, at its Second Annual Meeting in Seattle, Wash., May 29, 1931.

Division of Sanitation of this department began an organized series of surveys of the sanitary condition surrounding the shellfish growing areas, culling houses, shucking and packing plants. In 1927 Rules and Regulations for the Sanitary Control of Shellfish were adopted by the State Board of Health. The department was materially assisted in initiating this control work by engineers of the U. S. Public Health Service, whose advice based upon experience in other states was of great value.

The Rules and Regulations governing the sanitary control of shellfish areas embody—boat sanitation, culling houses, examinations for employees and carriers, growing areas, sewage disposal, storage and cleansing, and pollution. The regulations covering shucking and packing plants relate to communicable diseases, equipment, operation, and construction. Regulations governing the handling and sale of shellfish subsequent to production and shipment deal with certification, records, shell and shucked stock as well as bulk shell stock.

The surveys and control work which have resulted in the certification of 43 shellfish companies and dealers approved by the State Department of Health and U. S. Public Health Service, have demonstrated that the sanitation of all phases of the shellfish industry is equally essential.

Owing to the fact that the population adjacent to the shellfish region is scattered and small, acute problems in the control of polluted areas have not yet arisen. Less than 0.1 per cent of the total shellfish producing area is subject to condemnation on account of uncontrolled pollution.

The problems of sanitary control have consequently been concerned with the sanitation of the shore line and contiguous areas which drain into the shellfish producing bays and inlets, as well as the control of population actually engaged in the shellfish industry.

Surveys have shown that houses along the shore line have been equipped with cesspools with the overflow passing onto the beach. In such instances septic tanks equipped with absorption areas or chemical toilets have been successfully used. In certain locations pit privies have sufficed, if properly situated, to prevent seepage into the bay or inlet. No fixed distance as on watersheds has been established for disposal equipment adjacent to salt water. Contamination reaching streams which enter the bays and inlets has been controlled in a similar manner.

During the preliminary surveys it was observed that the living quarters on the culling floats were equipped with primitive disposal systems of the dump privy type. Since oysters are usually held on

floats adjoining the living quarters for varying periods, it was not uncommon to observe fecal matter floating in the water within the float enclosure immediately in contact with the oysters. A number of cases of typhoid were traced directly to such conditions. It was therefore required that the culling floats be provided with chemical toilets. The problem of the disposal of the contents of these toilets when full was solved by locating them in most cases on a separate float, which could be detached from the culling house and towed down the bay for disposal during ebb tide. In a few instances where the culling houses were on the beach, disposal of the contents of the toilets by burial or earth absorption was feasible. Chemical toilets throughout the shellfish region have been satisfactorily installed and operated.

Sea water and shellfish samples have been periodically taken on the floats at the culling houses. Prior to the installation of chemical toilets and improvement in shore line sanitation, the scores of such samples ranged occasionally as high as 50. During the past 3 years shellfish and sea water scores within the oyster producing areas have ranged from 0 to 2, with the exception of one bay, in which an increase in the volume of raw sewage discharged from an adjacent town has rendered the oysters subject to periodic pollution, and therefore subject to withdrawal of certification. During the same period the oysters subject to sewage pollution deteriorated from other causes and consequently were not handled.

The domestic water supplies used by employees on the floats have also been checked and the employees examined for presence of typhoid carriers.

It has further been required that bath and laundry waste waters being discharged into tidal waters be treated for a period of 5 minutes with an effective sterilizing agent, equivalent to 3 p.p.m. of available chlorine.

Owing to the fact that small boats are used in transporting shellfish from culling houses to the shore, and since the distances covered by the boats are short, pails have been found to be adequate for excreta collection with provisions for its burial on shore above high tide lines.

Precautions against pollution of shellfish prior to shipment are taken by requiring strict control over removal of shellfish from polluted waters and relaying in clean and safe waters. During the past 2 years, permission has been granted under the department's supervision to remove about 600 sacks of oysters from a polluted area and to relay in a certified area with the restriction of holding the shellfish in this area for a period of at least 1 month before sale or shipment. The season during which the transfer took place was not the hiberna-

tion period. It is also necessary to prescribe that when shellfish are stored, floated, or cleansed, the water in which storage takes place must be of a standard of purity at least as high as that designated for growing areas.

During the early surveys many of the shucking and packing plants throughout the shellfish region were found to be insanitary and improperly designed.

The defects frequently observed were: inadequate lighting and ventilation, washing and packing room combined with shucking room, lack of floor drainage, shucking benches of material not permitting cleansing, no hot water or steam supply, lack of refrigeration, corroded and dented utensils, insanitary lavatory and sewage disposal facilities, and water supply of questionable purity.

Shortly after the Rules and Regulations concerning Sanitary Control of Shellfish were adopted, the majority of the shucking and packing plants were ready for certification. In 2 instances modern concrete plants were installed, which are model establishments.

Concrete shucking benches have been installed in most plants with entire success, since they can be readily cleansed. Monel metal utensils, though high in first cost, are used throughout most of the shucking and packing plants. These can be readily cleaned and do not deteriorate or chip as enamelled ware in constant service does.

In some of the smaller shucking plants kerosene burning sterilizers have been installed for the sterilization of utensils. In the large plants salmon retorts are used as sterilizers.

The shucked shellfish are cooled as soon as possible after shucking. For such refrigeration, outside containers are provided for ice, and no ice or other foreign substances are allowed in contact with shellfish. A temperature of 50° F. or below, but above freezing, is maintained in refrigerators where shucked shellfish are stored.

The shucked stock is packed in sealed cans, glass bottles and parchment containers. It is required that returnable shipping cans be cleaned and sterilized by steam prior to refilling, and that non-returnable cans be rinsed with hot water before filling.

It is required that no oysters, clams or scallops be sold or offered for sale in the State of Washington unless the shellfish shall have been produced and shipped in conformity with the regulations of the state in which they are grown and packed, and unless the shipment shall have been accompanied by tag, label, or other mark showing that the shipper has been duly certified by the state in which the plant is operated, such certification having been approved by the U. S. Public Health Service for shipments in interstate commerce.

In order to insure a safe product, all phases of the shellfish industry are subject to periodic inspection. New companies are organizing, especially in the Willapa Bay district, and new problems in the sanitary control of shellfish must inevitably arise since the industry is increasing in size. The industry as a whole has heartily coöperated with the State Department of Health by making the necessary improvements in the plants to conform to the Rules and Regulations on the Sanitary Control of Shellfish.

The Air Jet Hydrocyanic Acid Sprayer for Fumigation

A NEW method of using hydrocyanic acid as a fumigant is described in *Public Health Reports*. It has been shown that the methods in general use failed to destroy all rats and vermin, and there has been persistent recurrence on some ships in spite of fumigation, due to failure of the gases to penetrate into protected rat harborages. This is dependent upon the concentration of the fumigant to a certain extent. With the use of Zyklon, and other preparations of hydrocyanic acid in the solid form, the highest concentration is found in the hatchway near the bottom of the hold. All such materials require time for the evaporation of the gas so that the maximum concentration is not secured immediately.

At the New York Quarantine Station, liquid HCN is now used by the spray method, operated with a jet of compressed air. The apparatus is an adaptation of the oxyacetylene blowpipe. It is most effective when the HCN is supplied under a pressure of 75 to 100 lb., and the air from 100 to 200 lb. A smaller spray apparatus consisting of a heavy glass bottle supported by a heavy wire mesh has been devised for smaller compartments.

The great advantage of the new method is that the diffusion of the gas is uniform, maximum concentration being attained at once, and in the places where it is most needed. The disadvantage lies in the necessity of a compressed air apparatus or reservoir, which, however, can be easily installed in larger stations. For the present, at stations where the amount of fumigation done is small, it constitutes a real objection. Another danger lies in the transportation of liquid HCN.

The containers approved by the Interstate Commerce Commission are too heavy for ready handling on shipboard. The lighter containers for use on ships can be transported only by the quarantine boat. When fumigating boats are available, air compression apparatus may be installed as a part of the regular machinery. A record of the fumigations at New York with the spray apparatus shows a high degree of success.—C. L. Williams, Surgeon, U. S. Public Health Service, *Pub. Health Rep.*, July 24, 1931, p. 1755 (abstract).

Western State Boards of Health*

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IN the 17th and 18th centuries there were in this country no permanent organizations to promote public health. Upon the occurrence of an epidemic of proportions sufficient to cause widespread alarm, a committee, consisting largely of local physicians, was appointed to promulgate and enforce quarantine restrictions.

Louisiana† was the first state to establish by law a state board of health (1855). Its activities were largely confined to enforcing maritime quarantine regulations in an effort to prevent the importation of yellow fever. Fourteen years later, an eastern state, Massachusetts, established a board of health. This measure had been recommended 20 years previously by Samuel Shattuck, a layman, in the excellent report of his sanitary survey of public health conditions in the state. In Massachusetts the original activities of the state board of health were not confined to combating a single disease, as was the case in Louisiana, but were directed against all the diseases then considered preventable. The third state board of health was created by another western state, California (1870), just one year after the establishment of the Massachusetts board; then still another western state, Minnesota, followed suit; and, from that time on, every few years, other states formed boards of health. Washington created such a board in 1891.

At the present time, 4 western states, Idaho, New Mexico, Nebraska, and Oklahoma, do not have state boards of health or advisory public health councils, although one of them, Oklahoma, has a state health department. The other 3 have state public health bureaus within the state welfare departments. In the remaining 44 the state board of health supervises the state health department; it also formulates the policies of the state health department and has certain legislative authority in making rules and regulations for the protection of the health of the population.

The early conception of the duties of a state board of health was

* Read before the Western Branch, American Public Health Association, at its Second Annual Meeting in Seattle, Wash., May 30, 1931.

† For convenience of description, the 22 states west of the Mississippi River will be considered western states.

that it should investigate the cause of epidemics and give advice as to their prevention, especially to the legislature and local governmental bodies. For a long period many state boards of health continued to follow this program, refusing other responsibilities. The reason for this was, doubtless, the precedent established in Massachusetts. Combating epidemics was considered to be the sole duty of the sanitary authorities; scavenging, sewerage, and ventilation were the weapons invariably relied upon to destroy contagion. The theory of the spontaneous origin of disease through decaying vegetable and animal matter was then at the height of its popularity. With the development of bacteriology as a science, which followed upon the pioneer work of Pasteur, a vigorous campaign, in which Chapin, the father of modern public health procedure in this country, took a leading part, was instituted against these antiquated procedures and theories. But even in this more enlightened age, health officers frequently encounter persons whose opposition to modern public health procedures has as its origin the archaic beliefs and practices of the past.

Of the 22 states west of the Mississippi, which have an aggregate population of 37,369,967, or 30.4 per cent of our total population, 19 have areas larger than the 6 New England states. The governments of the western states are of much more recent origin than are those of the states east of the Mississippi. For instance, the average date of admission to statehood of the eastern states is 1804, and of the western states 1871, a difference of 67 years—more than a generation. The area of the 22 western states is $2\frac{1}{2}$ times greater than that of the 26 eastern states, 2,117,654 square miles against 856,060. Hence, with the comparatively small population, scattered over a vast area, the problems of the western state boards often differ from those in the East, and the cost of conducting health work is correspondingly greater.

The tax levy of the average western state is \$51,925,000 as compared with \$90,345,000 for the average eastern state, a difference of \$38,420,000 in favor of the eastern state. The income of the average eastern state is 43 per cent greater than that of the average western state. Therefore, it is not surprising that the most outstanding problem of western state health departments is that of securing from their legislatures appropriations approaching adequacy, the need of which may be better appreciated when it is realized that in 1930 the per capita cost of eastern state health departments was \$.15 as compared with \$.06 for the western states—60 per cent greater for the East than the West.

The average yearly salary of a western state health officer is \$4,527, that of an eastern state health officer, \$6,628—a difference of 32 per

cent in favor of the latter. Nor is the tenure of office in the West as secure as in the East. Of the 26 eastern states, the state health officers in 21 are appointed by a non-partisan board of health, whereas in the West this is the case in only 13 of the 22 states. In the West the state health officer is usually appointed by the governor, or by the governor with the consent of the senate. The states making the greatest progress in public health work are those in which the health officer's tenure of office is based upon efficiency.

In 34 states the term of office of the members of the state board of health expires in alternate, or in different years, so that at least part (usually a majority) of the board will always consist of men who are experienced in handling its affairs. Among the western states there are 13 such boards and among the eastern 21.

Within recent years there has been a noticeable trend toward the cabinet form of state government. The stimulation of sentiment for this has been due largely to the activities of individuals or agencies that specialize in reorganizing government services on an efficient basis. When such state governments are established, the state health officer is often made a member of the governor's cabinet and receives his appointment directly from the governor. Hence, the appointment becomes political and with each change in administration there is usually a change of state health officer. Such organizations have so far proved to be a detriment to state health work.

In 3 of the western states, the health department is a state public health bureau, maintained within the state welfare department. In 2 of these, Nebraska and Idaho, a layman who has had no previous training in health or welfare work is director of the state welfare department. In New Mexico, a state board of public welfare formulates the policies of the department. In addition to the public health bureau there are others within the state welfare department. In Idaho, according to the former director of the department, the public health activities amount to at least 98 per cent of the total activities of the state welfare department. Such a condition is unfortunate, inasmuch as the state's public health policies are formulated by a person insufficiently prepared for such responsibility. This, however, is not the case in New Mexico and Nebraska where a full-time medical director is in charge of the state public health bureau. On the staff of the Idaho State Welfare Department there is a part-time medical adviser.

The most significant of recent developments in state health work is the policy of giving state aid, financial and other, in providing efficient full-time local health service.

According to the reports of the U. S. Public Health Service the first

rural county within the United States to place its health work on a full-time basis was Yakima County, Wash. (July 1, 1911). This action established an important precedent which has since been followed by many counties throughout the United States as well as by similar geographical units in many foreign countries. Each year the number of county health units has shown a decided increase. On December 31, 1930, there were 534 rural counties in the United States maintaining full-time health departments. A number of the state health departments have stimulated the development of such local departments by securing from the state legislatures specific appropriations to be used in defraying part of the costs of their maintenance. Among the western states, 6 have such appropriations, and among the eastern, 10.

Table I shows the growth of full-time county health units over a 5-year period in both the eastern and western states. It is interesting to

TABLE I

Year	Eastern States		Western States	
	Number	Per Cent of Increase	Number	Per Cent of Increase
1925	219		85	11.7
1926	247	12.8	95	31.6
1927	293	18.6	125	12.8
1928	341	16.4	141	3.5
1929	383	12.3	146	8.9
1930	410	7.0	159	

note that during the 5-year period covered, the percentage of increase in county health units is the same in both groups.

In addition to state aid, a number of the county health units receive financial assistance from the U. S. Public Health Service and the International Health Division of the Rockefeller Foundation, and occasionally from other public health agencies that have adopted the policy of aiding in the development of full-time health service in rural areas.

The average annual budget for health units in rural counties is \$10,000. This amount ordinarily provides for a full-time staff consisting of 1 physician as health officer, 2 nurses, and 1 stenographer-clerk, or 1 nurse, 1 sanitary inspector, and 1 stenographer-clerk. The aid to the county is usually decreased following the demonstration of the value of the work, and when this occurs, the county's appropriation is correspondingly increased.

The legislatures of 4 of the western and 12 of the eastern states have enacted permissive county health unit laws legalizing the crea-

tion of full-time county health departments and permitting the incorporated towns within the county to consolidate their health work with that of the county. Most of these laws also permit the county to levy a specific tax for their maintenance.

Alabama has the largest number of full-time county health departments, 53 of its 67 counties maintaining such organizations; 88 per cent of its population is served by full-time health departments. Probably, within the next 4 years, there will be 1 or 2 states in which every county will have a full-time health department. Ohio, Maryland, and Arizona, in the order mentioned, are next in having the largest per cent of their rural population provided with full-time health service.

The problem of securing adequately trained personnel for such units, in the absence of which no unit should be organized, has proved to be greater than that of securing the necessary appropriations for their maintenance.

With the growth in efficient local health service there has been a tendency to decentralize the state health department, using the funds thus saved in aiding in the development of county health units. In the states in which the county health units are most numerous it is the opinion of public health authorities that the ideal state health department is one that maintains only the most essential bureaus, with a director in charge of each who is really an expert in his work, and, as such, can command the respect and confidence of the local health departments. Thus his advice and assistance to such departments are of great value. Needless to say, his scholastic and professional standing should be on a par with that of the departmental heads of our leading universities and colleges. This type of state health organization is the goal which many of the more progressive state health departments are striving to reach.

In such times as the present, with the financial depression so widespread, the demands on the state health departments have greatly increased. Seemingly this has not been appreciated by our appropriating bodies. In the states whose legislatures recently adjourned, only a few of the state health departments were provided with funds approaching adequacy; many have had their usual appropriations reduced; a few have received a small increase.

Studies on the Self-Disinfecting Power of the Skin*

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ARNOLD and his coworkers¹ have reported experiments from which they conclude that the skin possesses some inherent power to destroy bacteria. This disinfecting property was more marked with clean than with dirty skin. More recently similar experiments have been made with yeasts by Cornbleet and Montgomery.² In view of the importance of these conclusions from the standpoint of the spread of communicable disease and the influence of cleanliness as a factor in such spread, it seemed desirable to repeat the work.

The laboratory technic as described by Arnold, *et al.* was followed, *B. prodigiosus* being the test organism. Briefly, this consisted of immersing the hands in a dilute suspension of bacteria, gently rubbing a sterile cotton swab over a designated surface of the skin, inoculating an agar plate from the swab, incubating, and counting the colonies. Table I shows the results obtained, which coincide with those of Arnold. When the skin is rubbed with vaseline no such striking disappearance of bacteria is obtained. The experimental results were somewhat irregular but in general confirmed Arnold's findings. Similar results were obtained when the skin of the forearm was used instead of the hands, and the area inoculated by means of a gauze sponge which had been dipped in the bacterial suspension (Table II).

Since it is well known that viable bacteria exist in the skin, it seemed possible that some factors other than germicidal activity of the skin might account for the results. The technic was first investigated. It was found that in the streaking of the agar plates with the swab, some organisms were not removed. This is shown in Table III. After inoculating the agar surface, the swab was placed in a tube of broth and incubated over night. In a majority of instances the test organism, *B. prodigiosus*, was found. In some cases a skin organism, *Staphylococcus albus*, was present. These experiments were qualitative rather than quantitative and did not account for the observed de-

* Read before the Laboratory Section of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 17, 1931.

TABLE I

DISAPPEARANCE OF BACTERIA FROM THE SURFACE OF CLEAN HANDS

Colonies on Agar Plates

B. prodigiosus

Experiment No.	Time in Minutes							
	Palmar Surface				Dorsal Surface			
	0	10	20	30	0	10	20	30
1.....	47	0	0	7	16	0	0	0
2.....	288	0	0	0	384	0	0	0
3.....	In.*	48	84	0	480	3	2	0
4.....	300	0	0	0	56	0	0	0
5.....	80	8	0	0	200	24	0	0
6.....	1,450	0	0	0	840	0	0	0
7.....	1,010	0	0	0	490	0	0	0
8.....	650	1	0	0	550	0	0	0
9.....	2,240	149	0	0	850	0	0	0
10.....	580	1	0	0	420	2	4	0
11.....	290	4	24	0	260	730	13	0
12.....	138	1	0	0	29	0	0	0

* In. = too many colonies to count.

TABLE II

DISAPPEARANCE OF BACTERIA FROM THE SKIN OF THE FOREARM

Bacteria Applied with a Gauze Sponge

Experiment No.	Time in Minutes							
	A				B			
	0	10	20	30	0	10	20	30
1.....	1	1	0	0	22	4	0	0
2.....	51	0	1	1	94	17	0	4
3.....	57	0	0	1	65	3	2	0
4.....	168	0	0	3	170	3	2	1
5.....	120	0	0	10	8	8	0	1
6.....	0	0	0	0	1,200	3	0	0
7.....	2	0	0	0	180	0	0	0
8.....	1,350	1	0	1	510	0	2	1
9.....	98	0	2	3	370	1	0	0
10.....	750	0	0	0	1,300	13	1	0
11.....	850	0	2	0	320	19	20	10
12.....	111	0	0	0	500	25	22	2

A = swab rubbed gently over skin to remove bacteria.

B = swab rubbed over skin with pressure.

crease in bacteria. However, they served to show that the organisms were never entirely destroyed on the skin as might be concluded from

the agar plate counts. It was thought that the technic used gave comparable results.

During the experiments described it was observed that the surface of the skin usually became dry by the end of 10 minutes. Arnold and

TABLE III

DISAPPEARANCE OF BACTERIA FROM THE HANDS AND INCUBATION OF SWAB IN BROTH

B. prodigiosus

Experiment No.	Time in Minutes							
	Palmar Surface				Dorsal Surface			
	0	10	20	30	0	10	20	30
1 AP.....	2,000	65	410	17	In.	580	400	0
Br.....				+				-
2 AP.....	410	6	0	0	320	0	0	0
Br.....	+	+	+	C	+	+	+	+
3 AP.....	600	C	3	0	3,000	180	22	8
Br.....	C	C	C	C	+	C	C	+
4 AP.....	780	15	6	3	1,200	12	15	1
Br.....	+	+	+	+	+	+	C	C
5 AP.....	330	1	1	0	1,300	C	0	1
Br.....	+	+	+	C	+	+	+	+
6 AP.....	580	15	C	1	950	300	1	0
Br.....	+	+	+	+	+	+	+	+
7 AP.....	1,700	0	900	75	1,500	900	100	100
Br.....	+	+	+	+	+	+	+	+
8 AP.....	820	32	28	33	750	320	5	4
Br.....	+	+	+	+	+	+	+	+
9 AP.....	650	13	11	0	840	0	0	0
Br.....	+	+	+	+	+	+	+	+
10 AP.....	700	112	0	0	1,000	0	0	0
Br.....	+	C	+	C	+	C	C	C
11 AP.....	500	130	0	0	700	2	0	8
Br.....	+	+	+	C	+	+	+	+
12 AP.....	910	1	0	0	750	3	0	0
Br.....	+	+	+	C	+	+	+	C

AP = colonies on agar plate.

Br = growth of test organism in broth culture inoculated with swab.

C = contamination with *Staphylococcus*.

In. = too many colonies to count.

TABLE IV

SURVIVAL OF BACTERIA ON SKIN KEPT MOIST BY WATER VAPOR

<i>Experiment No.</i>	<i>Time in Minutes</i>			
	0	10	20	30
1.....	920	500	850	1,000
2.....	In.	400	480	350
3.....	680	720	950	500
4.....	480	560	520	400
5.....	950	750	375	420
6.....	540	550	200	460
7.....	500	480	95	120
8.....	520	250	63	184
9.....	500	158	200	280
10.....	650	210	280	220
11.....	420	200	210	120
12.....	310	200	300	150

In. = too many colonies to count.

his associates recognized the possible influence of this factor and reported that holding the hand in steam during the experiments did not change the results. Cornbleet and Montgomery also mention, but do not stress, the influence of moisture. Our experience is shown in Table IV. Similar results were obtained when the skin was kept moist by covering with wet gauze (Table V). This latter procedure is subject to some error because of the possible removal of bacteria by the gauze.

TABLE V

SURVIVAL OF BACTERIA ON MOIST SKIN

<i>Experiment No.</i>	<i>Time in Minutes</i>			
	0	10	20	30
1.....	1,060	570	200	950
2.....	760	720	200	400
3.....	420	400	600	650
4.....	200	400	100	3
5.....	780	420	820	2
6.....	350	39	75	64
7.....	86	290	56	64
8.....	230	41	100	38
9.....	120	69	1	1
10.....	500	150	120	0
11.....	400	40	180	31

NOTE: In all cases the test organism was grown in broth inoculated with the swab used to streak the agar plates.

TABLE VI

DISAPPEARANCE OF BACTERIA FROM THE SURFACE OF THE SKIN IN RELATION TO DRYNESS

B. prodigiosus
Counts on Agar Plate

Experiment No.	Time in Minutes					
	0	10	20	30	40	50
1.....	3,360	3,300	3,900	2,400	630	0*
2.....	970	1,650	194	1,100	2,700 ¹	900 ²
3.....	2,760	2,400	2,400	2,100	2,100	18*
4.....	2,400	2,400	2,700	255*	0	
5.....	2,700	3,000	3,200	3,000	16*	
6.....	3,900	3,500	2,400	2,800	1*	
7.....	2,400	1,800	1,920	2,000	1,800	23*
8.....	In.	In.	1,800	133*	2	
9.....	In.	2,100	In.	31*	1	
10.....	1,800	2,000	2,100	2,100	88*	30
11.....	1,050	990	17*	70	0	

In. = too many colonies to count.

* = surface apparently dry.

1 = 50 minutes.

2 = 70 minutes.

The influence of drying seemed sufficiently important to investigate further. A suspension of the test organism was placed on the palm of the hand and areas swabbed as before. Careful note was

TABLE VII

DISAPPEARANCE OF BACTERIA FROM THE SURFACE OF GLASS SLIDES

B. prodigiosus 37° C.
Counts on Agar Plate

Experiment No.	Time in Minutes				
	0	10	20	30	40
1.....	200	39	130	0*	
2.....	350	350	In.	65*	1
3.....	In.	In.	In.	3*	0
4.....	In.	400	375	0*	0*
5.....	1,600	1,600	1,400	400	0
6.....	800	700	0	0*	40*
7.....	600	450	In.	In.	1
8.....	2,000	1,700	750	2*	0
9.....	750	1,200	600	17*	750
10.....	In.	In.	In.	870*	125*
11.....	1,270	980	520	620	3
12.....	1,900	1,100	1,200	400*	

In. = too many colonies to count.

* = surface apparently dry.

taken of the time at which the surface of the skin was apparently dry. The results are given in Table VI. The times required for disappearance of bacteria are not comparable with those recorded in Tables I, II, and III, since larger amounts of liquid were used to inoculate the skin. These results show that the large and striking drop in the number of bacteria recovered is without exception coincident with apparent dryness of the skin surface.

Another possible factor is the absorption of bacteria into the skin. An attempt was made to study this by removing a portion of skin from a cadaver, repeating the above experiments, and then examining stained sections of the skin. It was not possible to demonstrate the presence of bacteria in these sections.

If drying is the main factor causing the disappearance of bacteria from the surface of the skin, it should be possible to obtain the same results on other materials. This was done on glass slides, tanned hide (before and after washing), and filter paper. The results are recorded in Tables VII, VIII, and IX. The materials were kept at body temperature during the experiments. Again the apparent dryness of the surface was correlated with the disappearance of bacteria. Cotton swabs were also used, a number being immersed in the suspension at

TABLE VIII

DISAPPEARANCE OF BACTERIA FROM THE SURFACE OF TANNED HIDE AND ITS RELATION TO DRYNESS

Experiment No.	Time in Minutes									
	Unwashed Hide					Washed Hide				
	0	10	20	30	40	0	10	20	30	40
1.....	3,000	3,600	3,000	2,900	0* ¹	96	0*	0	0	
2.....	1,600	1,120	1,200	1,150	0* ²	1,700	37	0	0	
3.....	2,400	2,100	1,140	0	5* ³	2,000	250	0*	0	
4.....	2,700	1,900	1,500	1,500	6* ⁴	2,400	2,500	1,800	1,800	0* ⁴
5.....	1,400	1,300	1,500	38*		1,600	1,500	750	0*	
6.....	1,750	1,200	1,500	1*		1,250	1,400	197*	10	
7.....	1,500	850	1,200	73*		1,500	1,750	100*	1	
8.....	1,200	1,600	200*	49		1,100	1,400	48*	172	
9.....	1,700	2,000	1,500*	1		1,800	0*	0	0	
10.....	2,100	2,200	2,000	50*		2,200	33*	1	0	
11.....	2,600	2,400	2,500	1,500	250*	2,500	2,000	42*	0	
12.....	2 400	2,400	2,400	300*		2,100	2,500	400*	45	

* = surface apparently dry.

1 = 4 hours 15 minutes.

2 = 1 hour 45 minutes.

3 = 65 minutes.

4 = 1 hour 20 minutes.

TABLE IX

DISAPPEARANCE OF BACTERIA FROM THE SURFACE OF FILTER PAPER

B. prodigiosus
Counts on Agar Plates

Experiment No.	Time in Minutes			
	0	10	20	30
1.....	150	180	0	0
2.....	1,000	50	4	6
3.....	220	0	0	0
4.....	171	0	0	0
5.....	2,400	0	0	0
6.....	610	5	0	0
7.....	250	0	0	0
8.....	1,500	0	0	0
9.....	700	2	0	0
10.....	300	46	0	0
11.....	1,200	90	0	0
12.....	36	0	0	0

TABLE X

SURVIVAL OF BACTERIA ON THE SURFACE OF AGAR PLATES

B. prodigiosus
Counts on Agar Plates

Experiment No.	Time in Minutes						
	0	10	20	30	40	50	60
1.....	700	500	4	0	0		
2.....	250	120	In.	350	In.	300	
3.....	1,000	1,100	290	900	600	750	400
4.....	950	550	650	550	350	0	
5.....	In.	In.	680	—	800	750	900
6.....	880	600	650	350	410	270	540
7.....	500	150	300	300	In.	400	75
8.....	760	420	100	530	380	370	0
9.....	75	262	128	45	210	14	3
10.....	1,070	380	1	350	500	3	200
11.....	330	160	200	310	79	140	0
12.....	96	43	104	38	6	1	0

In. = too many colonies to count.

the same time and a different swab used at each time interval. Bacteria remained viable on these swabs for longer periods than on filter paper or hide. The surface of a 5 per cent agar jelly was then tried, since such a surface would dry more slowly than that of filter paper.

The results are shown in Table X and are such as might be anticipated.

Filter paper was kept moist by placing it on the surface of an agar plate. A comparison of Tables XI and IX shows the effect of moisture. However, it was not possible to restore the viability of bacteria from the dried surface by moistening. This is true not only for inert ma-

TABLE XI

SURVIVAL OF BACTERIA ON THE SURFACE OF FILTER PAPER KEPT MOIST

B. prodigiosus
Counts on Agar Plates

Experiment No.	Time in Minutes			
	0	10	20	30
1.....	960	540	400	0
2.....	750	550	450	820
3.....	470	65	1	0
4.....	600	840	640	580
5.....	250	460	300	290
6.....	82	750	800	169
7.....	15	400	410	500
8.....	420	1,100	450	1,050
9.....	320	370	980	1,100
10.....	480	570	700	650
11.....	290	320	300	550
12.....	21	500	440	510

TABLE XII

RECOVERY OF BACTERIA FROM FILTER PAPER

B. prodigiosus
Poured Agar Plate Counts

Experiment No.	Time in Minutes			
	0	10	20	30
1.....	In.	0	0	0
2.....	4,000	68	23	40
3.....	2,000	18	18	3
4.....	4,200	104	3	30
5.....	2,400	670	90	6
6.....	3,500	3,000	210	310
7.....	2,700	220	8	4
8.....	2,400	750	38	220
9.....	2,700	600	250	64
10.....	3,000	270	7	12
11.....	2,500	1,600	1	0
12.....	2,700	480	147	170

In. = too many colonies to count.

terials but for the living skin as well. The technic was also tested by placing the filter paper in broth after rubbing with the swab. The test organism was found to be present uniformly even when no colonies appeared on the agar plate. Poured agar plate counts were also substituted for Arnold's technic. The pieces of filter paper were macerated in sterile water at the end of each time interval and plate counts made in the usual manner. The results are shown in Table XII. These results are not so striking as those of Table IX, but a relatively rapid death of organisms is indicated.

SUMMARY

Bacteria applied to the skin diminish in numbers very rapidly. This is particularly noticeable during the first 10 minutes. In the experiments reported, *B. prodigiosus* was used as the test organism.

Similar results are obtained with inert materials such as glass slides, filter paper, and tanned hide.

The most important factor involved appears to be moisture. Marked disappearance of organisms was coincident with apparent dryness of the surface. On surfaces kept moist bacteria remain viable for much longer periods than when the surfaces are allowed to dry.

These experiments fail to indicate any inherent germicidal power of living skin.

REFERENCES

1. Arnold, Gustafson, Hull, Montgomery and Singer. *Am. J. Hyg.*, 11: 345, 1930.
2. Cornbleet and Montgomery. *Arch. Derm. & Syph.*, 23: 908, 1931.

NOTE: Since these results were obtained, Arnold has suggested that if the time interval between inoculation of the skin and the agar plate is shortened, his phenomenon is more striking; this is being studied at the present time.

Report on 31 Strains of *B. dysenteriae* *Sonne* Isolated During an Epidemic in Rochester, N. Y.

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SINCE 1915, when Sonne¹ first described a late lactose fermenting bacillus as the causative agent of dysentery in Copenhagen, very few reports have been published in this country on the isolation of *B. dysenteriae Sonne* from either sporadic or epidemic dysentery. Gilbert and Coleman² in 1929 reported the occurrence of 12 cases of Sonne dysentery in New York State, and more recently Nelson³ in Boston, and Johnston and Brown⁴ in Toronto have published clinical and bacteriological data on this type of infection. Koser⁵ made a study of 19 strains from a wide variety of sources, and believes that a search for the organism might conceivably show it to be more frequent in the United States than was formerly supposed.

During the fall of 1930, there were encountered in Rochester, N. Y., 40 cases of dysentery of which 31, or 77.5 per cent, were due to the Sonne type of organism; 5, or 12.5 per cent, to the Flexner type; and 4, or 10 per cent, were undetermined. The strains isolated from these 4 cases were in all probability Sonne as they were not agglutinated by Flexner antiserum and only in the lower dilutions by polyvalent dysentery serum. Unfortunately they were not kept for further study.

Of the 31 cases due to *B. dysenteriae Sonne*, 27 occurred among children and 4 among adults. It is interesting to note in the cases of 23 children admitted to the Strong Memorial and Rochester Municipal Hospitals that a provisional diagnosis of dysentery was made in only 12, or a little more than 50 per cent. Poliomyelitis, encephalitis, tetanus, acute appendicitis and acute upper respiratory infection were some of the diagnoses. This is unlike the Flexner type of infection where the diagnosis of dysentery is easily made upon the appearance of blood and mucus in the stools. Blood does not appear in the stools of Sonne dysentery cases so early as in the Flexner, and neither is the diarrhea marked at the onset. The stools from the Sonne cases are usually green, watery, contain mucus, and may or may not contain

blood. In over 80 per cent of the cases, the first stools received for culture were positive for *B. dysenteriae* Sonne, but in a few instances it was necessary to obtain several specimens before the organism was isolated.

A cultural and serological study was made of these 31 strains of *B. dysenteriae* Sonne and they were compared with 6 known strains—5 received from the New York State Laboratory at Albany, and 1 (*B. ceylonensis* A)⁶ from Koser in Chicago. All of the strains were non-motile; produced no indol in 48 or 72 hours; did not liquefy gelatin in 14 days; reduced nitrates to nitrites, and formed acid without a clot in brom-cresol-purple milk.

In studying the fermentation reactions, 16 different carbohydrates were used and they were run in 2 series, the first set being sterilized by filtration and the second by autoclaving. There were no differences in reactions of the strains in the 2 series. All of the strains produced acid without gas in 24 hours in glucose, mannitol, maltose, 1-arabinose, levulose, galactose and rhamnose. No acid or gas was formed in 14 days in xylose, dulcitol, sorbitol, salicin, inositol and inulin. The fermentation of lactose, sucrose and raffinose was delayed. Lactose was fermented by all strains in from 2 to 14 days, the average time being 7 to 10 days.

Our strains did not acquire the ability to attack this sugar in a shorter time by growing on artificial mediums. All except 3 strains (Nos. 26, 32 and 34) when first isolated fermented sucrose in from 4 to 16 days, but after being subcultured repeatedly, only 11 strains produced acid in 2 weeks. Raffinose was fermented by all strains in from 4 to 9 days.

In Table I, the results of the serological tests are tabulated. For purposes of identification when the strains were first isolated, agglutination tests were made with a polyvalent dysentery serum and 2 monovalent Sonne serums (Nos. 1,621 and 261) sent to us from the New York State Laboratory at Albany. Eighteen to 24 hour cultures in 2 per cent peptone water or saline suspensions of agar slant cultures were used as antigens. With the polyvalent serum there were 12 strains which were not agglutinated; 1 strain was agglutinated in a dilution of 1-640; 5 in 1-320; 5 in 1-160; 3 in 1-80; 2 in 1-40 and 2 in 1-20. One strain was not tested when first isolated and was later lost. All of the known Sonne strains and the strain of *B. ceylonensis* A⁶ were agglutinated by the polyvalent serum.

In the case of the monovalent anti-Sonne serums, there were considerable variations, and in all cases where there was agglutination, the clumping was very fine. A hand lens was used to read the tests. The Sonne immune serum No. 1,621 agglutinated 15 strains out of 31.

TABLE I

RESULTS OF AGGLUTINATION TESTS

(Greatest dilution of serum showing complete agglutination)

Strain No.	Albany polyvalent dysentery serum	Albany anti-Sonne serum No. 1,621	Albany anti-Sonne serum No. 261	Rochester anti-Sonne serum No. 5	Koser's anti-ceylonensis serum
1	1-320	1-1,280	1-1,280	1-640	1-1,280
4	1-80	—	1-2,560	1-320	1-1,280
5	—	—	1-640	1-320	1-1,280
6	—	—	1-640	1-320	1-1,280
7	1-20	—	1-640	1-320	1-2,560
8	1-40	—	1-1,280	1-20	1-2,560
9	—	—	1-640	1-320	1-2,560
10	—	—	1-640	1-320	1-2,560
11	—	—	1-160	1-320	1-2,560
12	—	—	1-640	1-320	1-2,560
14	1-160	—	1-160	1-320	1-5,120
15	1-80	1-320	—	—	—
16	1-320	1-320	1-320	1-320	1-5,120
18	—	1-320	1-320	1-320	1-5,120
19	1-80	1-320	1-160	1-320	1-5,120
21	—	1-320	—	1-20	—
22	1-640	—	1-640	1-320	1-20,480
23	1-20	1-640	1-640	1-320	1-20,480
24	1-320	—	1-640	1-320	1-20,480
25	1-160	1-640	—	—	—
26	—	1-320	1-640	—	—
27	1-320	1-640	1-640	1-320	1-20,480
28	1-160	1-640	1-640	1-80	1-10,240
29	—	—	1-320	1-320	1-20,480
30	1-160	—	1-320	1-320	1-10,240
31	1-320	—	1-640	1-320	1-10,240
32	1-160	1-320	1-640	1-320	1-10,240
33	1-40	—	1-640	1-320	1-10,240
34	—	1-640	—	—	—
35	—	1-320	—	1-320	1-10,240
36	—	1-320	—	1-320	1-10,240
<i>B. ceylonensis A</i>	1-40	—	—	1-320	1-1,280
Albany 247	1-160	—	—	1-320	1-5,120
249	1-160	—	—	1-320	—
261	1-160	—	—	1-160	1-5,120
265	1-80	—	—	1-320	—
266	1-80	—	—	1-160	—

Three of these (Nos. 15, 21 and 25) were not agglutinated by the anti-Sonne serum No. 261. This latter serum agglutinated 25 strains out of 28, there being an insufficient quantity of serum to test the last 3 strains isolated. Sixteen strains were agglutinated by No. 261 and not by No. 1,621; 8 strains were clumped by both serums. Strains Nos. 1, 4, and 8 were inagglutinable in either serum when peptone water cultures were used as antigens; but the saline suspensions were ag-

glutinated as shown in the table. The positive results obtained with serum No. 1,621 against strains Nos. 16, 18, and 19 were also with saline suspensions from agar slant cultures. In addition to giving a greater number of positive results, the saline suspensions produced much larger clumps, making the tests easier to read. The supply of these serums from the New York State Laboratory at Albany was insufficient to permit repeating all of the tests with saline suspensions in place of the peptone water cultures.

In view of the variability of these results, an attempt was made to produce other serums against some of the strains isolated in our laboratory. Two strains, Nos. 5 and 32, were selected as they agglutinated well by the Albany serums. Rabbits were inoculated intravenously first with heat-killed and later with living organisms. One of the animals died after the third injection, but the other survived and a serum was obtained which completely agglutinated the homologous strain in a dilution of 1-320. This serum (called Rochester No. 5) agglutinated 23 strains in dilutions of 1-320; 1 in a dilution of 1-640; 1 in a dilution of 1-80; 2 in 1-20; 2 strains failed to agglutinate and 2 cultures were lost before tests could be made. Strain No. 1 gave a positive test with this serum when a saline suspension was used for agglutinating but was negative with the peptone water culture. The Rochester serum agglutinated the 5 Albany strains of *B. dysenteriae* Sonne in dilutions of 1-160 and 1-320 and the strain of *B. ceylonensis* A as high as 1-320. This serum, while it agglutinated more strains than the Albany serum No. 1,621, proved no better than Albany serum No. 261.

Through the kindness of Dr. Koser, we obtained an immune serum prepared against a strain of dysentery bacillus isolated by Castellani and called by him *B. ceylonensis* A. Dr. Koser studied this strain and found it to be the same as *B. dysenteriae* Sonne. In running the tests with this serum, the first 10 strains were set up in duplicate using as antigens cultures in peptone water and saline suspensions. The results were the same with both antigens—all of the strains being agglutinated—so it was decided to set up the remaining 21 strains with the saline suspensions only. Out of the entire 31 strains this serum agglutinated 26 strains, failed to agglutinate 3, and 2 were lost. Two of the known strains of Sonne were agglutinated by the anti-ceylonensis serum, but the ceylonensis strain was not agglutinated by the Albany serum No. 1,621. There was insufficient quantity of serum No. 261 to use against the ceylonensis strain. It is obvious from these results that the serum sent by Dr. Koser is the best of the 4 serums studied.

A few agglutination tests were made, using the patients' serums, but as only 1 out of 7 was positive (strain No. 26 positive in 1-320; strains Nos. 1, 4, 5, 6, 7, 8 and 9 negative), no further attempt was made to obtain serum from the other cases in the hospital. Fraser, Kinlock and Smith⁷ reported positive results with patients' serums in from 7 to 20 days after the onset, and our failure to obtain similar results may have been due to the fact that the serums were collected from the patients too soon after the onset.

Culturally and serologically all of these strains fall into the same group and are identical with the 5 strains of *B. dysenteriae* Sonne isolated by the New York State Laboratory and with the strain of *B. ceylonensis* A isolated by Castellani. It would appear from the study of the serological reactions of these strains that it is difficult to produce an immune serum for *B. dysenteriae* Sonne which will agglutinate all strains. Until further work has been done, the use of more than one serum for the identification of an organism is recommended.

SUMMARY

The isolation of 31 strains of *B. dysenteriae* Sonne from an epidemic of dysentery in Rochester, New York, has been reported.

A cultural and serological study of the strains has been made and their reactions have been shown to be identical with strains of *B. dysenteriae* Sonne isolated by other workers.

REFERENCES

1. Sonne, Carl. Beobachtungen über klinik und Epidemiologie der giftarmen Dysenteriebazilleninfektion in Dänemark, *Ztschr. f. klin. Med.*, 81: 73-112, 1915.
2. Gilbert, Ruth, and Coleman, M. B. Cases of Dysentery in New York State Attributed to *B. dysenteriae* Sonne, *A. J. P. H.*, 19: 312-313, 1929.
3. Nelson, R. L. Sonne Dysentery. A Report of 32 Cases of Dysentery Caused by *Eberthella Paradyenteriae* Sonne, *J. Bact.*, 20: 183-201, 1930.
4. Johnston, M. M., and Brown, A. *B. dysenteriae* Sonne Infections, *Canad. Pub. Health J.*, 21: 369-402, 1930.
5. Koser, Stewart A., Reiter, Dorothy O. Bortniker, E., and Swingle, Edith L. A Study of *Bacterium dysenteriae*, Sonne Type, *J. Prev. Med.*, 4: 477-501, 1930.
6. Castellani, A. Cases of Fever Confounded with Typhoid, *J. Hyg.*, 7: 1-12, 1907.
7. Fraser, A. M., Kinlock, J. P., and Smith, J. Sonne Dysentery in Aberdeen, *J. Hyg.*, 16: 453-460, 1926.

Wassermann Reactions in College Students

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ESTIMATES as to the incidence of syphilis among the general population of this country vary enormously. The syphilologist, the neurologist, and the criminologist encounter so many syphilitic persons that they are apt to believe that this disease is almost universal; while the general practitioner and the specialists in many other fields see, or at least recognize, so few cases of syphilis that they are likely to consider it a relatively rare disease.

The studies which have been made concerning the incidence of syphilis have been based upon 3 types of data: the number of cases actually under treatment in a given locality, the proportion of syphilitics among the patients of general hospitals or clinics, and the results of routine Wassermann tests of groups of supposedly healthy individuals.

Incidence of Clinical Syphilis—Stokes and Brehmer¹ reported in 1920 that of 1,563 consecutive patients studied at the Mayo Clinic, 3.1 per cent had syphilitic infections sufficiently obvious to be detected without the use of the routine Wassermann test. According to occupational groups, the incidence was as follows: male railroad employees, 11.7 per cent; laborers, 6.1 per cent; business men, 3.8 per cent; and farmers, 1.5 per cent.

In the opinion of these authors the percentage of syphilis recognized would have been higher had the Wassermann test been employed routinely. Parran, Smith and Collins² of the U. S. Public Health Service, in 1928 found that 0.67 per cent of the population of 9 cities and 5 counties in West Virginia, Kentucky, Illinois and Arkansas were under treatment for syphilis at the same time. King³ reports that 1.57 per cent of the enlisted personnel of the U. S. Coast Guard were under treatment for syphilis in 1929, and Stoner⁴ concludes from observations of general hospital patients over a 10-year period that the incidence of syphilis among white patients has been 5 per cent, but that there has been a large decline in the last 5 years.

The Wassermann Reaction—This test, while not infallible, is a

valuable aid in the diagnosis of syphilis; in fact, at certain stages of the disease it may be the only demonstrable evidence of infection. In late syphilis, particularly of the central nervous system, a negative blood Wassermann is not infrequent, but earlier in the disease the percentage of error is small. Stokes' reported that the blood Wassermann was negative in 53 per cent of patients with late syphilis; Duke⁶ found a negative reaction in 5 per cent of patients in whom chronic late syphilis could be demonstrated by other means; and Dodd⁷ considered 0.7 per cent of 200 pregnant women syphilitic in spite of negative Wassermanns.

Wassermann Surveys—Over a period of several years, a considerable number of surveys have been made upon groups of persons of various social, economic, and intellectual levels. The results of some of the more recent of these are summarized in Table I.

TABLE I
WASSERMANN SURVEY RESULTS

<i>Number Examined</i>	<i>Group</i>	<i>Place</i>	<i>Year</i>	<i>Sex and Color</i>	<i>Per Cent Pos. Was.</i>
12,115	Hospital patients	Toronto	1916-1925	Male—white	7.0
				Female—white	4.8 (7)
1,307	Hospital patients	Germany	1923	Both sexes white	7.3 (8)
—	Clinic patients	Mayo Clinic	1930	Both sexes white	4.3
				to	5.6 (9)
2,000	Pregnant Women	Edinburgh	1927	Female—white	6.7 (6)
4,000	Pregnant Women	Baltimore	1920	Female—negro	16.3
				Female—white	2.5 (10)
2,509	Rural	Mississippi	1929	Male—negro	23.6
				Female—negro	24.3 (11)
8,004	Prisoners	San Quentin, Cal.	1928	Male—white	7.2
				Male—negro	18.1
				Male—Mexicans	15.6
6,450	Soldiers	Camp Funston	1919	Male—Yellow race	24.3 (12)
		Fort Riley		Male—white	10.5 (13)
1,019	Recruits (less than one week in army)	U. S. A.	1915	Male—white	16.8 (14)
621	Student cadets	West Point	1915	Male—white	5.5 (14)
721	Cadet officers	Training Camps	1919	Male—white	0.6 (13)
3,203	Cadet officers	Training Camps	1919	Male—white	5.8 (15)

It will be seen that the incidence of positive tests among white males varies from 5.5 per cent to 16.8 per cent,* and among white females from 2.5 per cent to 6.7 per cent.

* With the exception of Levin's small group of cadet officers in which he found an incidence of only 0.6 per cent.

Wassermann Results Among Students—For several years, routine Wassermann tests have been performed as a part of the periodic health examination given to students in the upper classes at the University of Minnesota. These examinations are required annually of all students in the Colleges of Education, Dentistry, and Medicine, and are offered on an optional basis to seniors in other colleges. The tests are performed by the laboratory division of the State Board of Health. Cases giving a positive reaction are retested several times. Students whose blood gives doubtful positive reactions are studied clinically and the blood rechecked from time to time.

Over a 2-year period, 5,000 such routine tests have been performed upon students, and of this number 10 have shown consistently positive reactions. Five other blood specimens were reported as giving doubtful or weakly positive reactions, but since subsequent tests of these same students showed negative reactions, and clinical evidences of syphilis were lacking, these were not included in the group of positive reactors. This gives an incidence of positive reactors of 0.2 per cent for the group as a whole; the rate for boys being 0.17 per cent, and for girls 0.25 per cent.

Clinical Reports—Only one of these 10 students with consistently positive Wassermanns was aware of having had a syphilitic infection, although a woman, age 50, previously married, and a man, age 31, apparently suspected that they might have a venereal disease. Of the total cases, 5 were girls and 5 boys. Two of the girls had congenital infections. One was under treatment at the time of her examination and the other had received some intravenous medication after the death of her mother, but did not know for what purpose this was given and after a time discontinued the treatments; the third girl had had repeated headaches over a period of 4 years; the fourth had no symptoms except a secondary anemia; and the fifth was without suggestive symptoms of any kind. Of the 5 boys, 1 had a scar from a chancre and a history of a sore throat a short time previous to the examination; the second also had had what was probably a chancre but no treatment; the third stated that 6 or 7 years previous, after using a pipette in a drug store in which he was working he had a lesion in the mouth which was very slow in healing; while the fourth and fifth gave no history of either primary or secondary lesions. Stokes and Brehmer's report that in their series 24 per cent of the patients gave no history of primary lesions and 62.5 percent had observed no secondary symptoms.

Comment—Although the incidence of syphilis varies in different social, economic, occupational, and intellectual groups, Dublin and Clark,¹² after a thorough investigation of the reports up to 1921, con-

cluded that no less than 10 per cent of the population of our large cities have been infected with syphilis, and that "this percentage may well prove to be a safe estimate for the country at large." Since that time, the incidence of syphilis has declined somewhat in the army" and probably in the civilian population; although Detweiler' at the Toronto General Hospital, who noted a decline from 1916 to 1921, states that from 1921 to 1925 the figures have remained constant. However, even if one assumes that syphilis has been on the decline in recent years, the incidence of 0.2 per cent in this student group is but a small fraction of what one would have reason to expect to find in the general population.

In view of this low incidence, the question naturally arises as to how representative these university students are of the general population. The group, of course, is select in respect to age because although the age range of these 5,000 students was from 18 to 50 years, the mean was 23.7 years; the median, 23 years; and the mode, 22 years. In a similar but older group, the incidence rate probably would be somewhat higher; although the group of 6,450 recruits in which Levin" reported an incidence of positive Wassermanns of 10.5 per cent ranged from 21 to 31 years; and the Wassermann survey of negroes in Mississippi" showed the highest incidence of syphilis in the 30 to 39 year group and the next in the 20 to 29 year group.

The fact that these students had the intellectual capacity and ambition to reach the upper classes in the university adds a considerable element of selection in certain regards. Socially and economically, however, they come from practically every group in the community; in fact, 40 per cent of the boys and 13 per cent of the girls in the university are totally self-supporting; and all in all, they probably are quite representative of the more intelligent portion of our population.

Although the number of cases of syphilis which have been discovered in this group of students by the use of the routine Wassermann test is small, the diagnosis of this disease in an early stage is of inestimable value to those concerned. By the use of this test as a routine procedure, it has been possible to place them under treatment probably years before clinical symptoms would have been sufficiently definite for diagnosis.

CONCLUSION

1. Ten positive reactions considered as diagnostic of syphilis were obtained in 5,000 routine Wassermann tests performed upon students of the University of Minnesota. This represents a rate of 0.17 per cent for boys, 0.25 per cent for girls, and 0.2 per cent for the group as a whole.

2. Estimates as to the incidence of syphilis among the general population vary

from 2 per cent to 15 per cent, with 5 per cent to 10 per cent being most common.

3. Although the number of cases of syphilis discovered by routine Wassermann tests in this group is very small, the discovery of even these few cases before the development of late symptoms is extremely worth while and well justifies the inclusion of the Wassermann test as a routine procedure in every periodic health examination.

REFERENCES

1. Stokes, I. H., and Brehmer, Helen E. Syphilis in Railroad Employees, *J. Indust. Hyg.*, 1: 419 (Jan.), 1920.
2. Farran, J. T., Smith, W. C., and Collins, S. D. Venereal Disease Prevalence in Fourteen Communities, *Ven. Dis. Inf.*, 5: 45, 1928.
3. King, W. W. Venereal Disease among Coast Guard Enlisted Personnel During the Fiscal Year 1929, *Pub. Health Rep.*, 45: 2979 (Dec. 5), 1930.
4. Stoner, W. C. The Diagnosis of Syphilis from the Standpoint of the Internist, with Special Reference to the Incidence of Neurosyphilis over a Period of Ten Years, *Am. J. Syph.*, 5: 340 (Dec.), 1928.
5. Lenke, W. W. Interpretation of the Wassermann Reaction, *Arch. Int. Med.*, 30: 531 (Nov.), 1922.
6. Dodds, Gladys. An Analysis of the Wassermann Reactions Obtained from 2,000 Consecutive Pregnant Women, *J. Obst. & Gynec. Brit. Emp.*, 34: 779, 1927.
7. Detweiler, H. K. A Survey of the Results of Routine and Other Wassermann Tests in the Toronto General Hospital for the Past Ten Years, *Pub. Health J. (Toronto)*, 5: 543, 1926.
8. Gelbenegger, Hermann. Die serologische Blutuntersuchung auf Lues als obligatorische Untersuchungsmethode in der ärztlichen Praxis, *Med. Klin.*, 19: 575 (Apr. 29), 1923.
9. O'Leary, P. A. Personal Communication.
10. Williams, J. W. The Value of the Wassermann Reaction in Obstetrics, *Bull. Johns Hopkins Hosp.*, 31: 335 (Oct.), 1920.
11. Wenger, O. C. A Wassermann Survey of the Negroes of a Cotton Plantation in Mississippi, *Ven. Dis. Inf.*, 5: 281, 1929.
12. Stanley, L. L. Syphilis among State Prisoners, *J. A. M. A.*, 92: 1238 (Apr. 13), 1929.
13. Levin, William. The Incidence of Syphilis among White and Colored Troops as Indicated by an Analytical Study of the Wassermann Reaction Results in over Ten Thousand Tests, *J. Lab. & Clin. Med.*, 5: 93 (Nov.), 1919.
14. Vedder, E. B. The Prevalence of Syphilis in the Army, *Bull. No. 8*, Office of Surgeon General (June), 1915.
15. Dublin, L. I., and Clark, Mary A. A Program for the Statistics of the Venereal Diseases, *Soc. Hyg.*, 7: 413 (Oct.), 1921.
16. Dekeyser, L. Le bilan de la syphilis, *Bruxelles Med.*, 5: 1153, 1191, 1214 (Aug.), 1928.

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ARISTIDES AGRAMONTE, M.D.

THE death of Dr. Aristides Agramonte, at the age of 63, on August 17, adds to the already too long list of members whom we have been called upon to mourn recently, and removes the last member of the U. S. Army Commission which solved the problem of yellow fever transmission and its control.

Dr. Agramonte had recently been appointed Professor of Tropical Medicine at the Louisiana University Medical School, New Orleans, and was in that city for the purpose of organizing his department. His death was apparently unexpected, due to some heart affection.

It will be remembered that in October, 1930, he was made an Honorary Fellow of the American Public Health Association, and a sketch of his life and work, accompanied by a photograph, will be found in the JOURNAL for December, 1930, page 1333.

It is only necessary to add here that in the death of Dr. Agramonte science has lost a devoted servant. His knowledge of tropical diseases and his great experience in the practical handling of them made him peculiarly fitted for the professorship he had just accepted. Our growing international relationships, coupled with the development of rapid transit by steamship and airplane, have brought us every year more and more into contact with the diseases of other countries, and especially those in close contact with us on the south. The importance of tropical medicine has grown step by step with these contacts.

Personally, Dr. Agramonte was a charming man, characterized by unfailing courtesy to all with whom he came in contact. Many will remember with pleasure meeting him last year in Fort Worth and recall the scholarly address given by him at that time. We can ill afford to lose men of his character and accomplishments.

THE MONTREAL MEETING

THE 1931 Meeting in Montreal—the first in 37 years—will always remain a bright spot in the memory of all those who were fortunate enough to attend.

Montreal is a historic city. There are many places of great interest which some of our members have visited during the session. It is the seat of two large universities—one bearing the name of the city and the other McGill. McGill was the home of the late Sir William Osler's activities, and his library, which contains a remarkable collection of first editions of rare books, as well as much other material, is one of the interesting sights for all concerned with medicine and public health.

It is impossible to speak too highly of the perfection of the arrangements made for the Association. Every aspect of the entertainment as well as business was attended to in the best possible way. In a community in which French is largely spoken as well as English, the French and the English vied with each other in making our stay both pleasant and profitable. With no disparagement to other cities which we have visited in the past, it can be said without hesitation that never before has the Association been more cordially entertained with more abounding hospitality.

In spite of the distances which many members were obliged to travel, the attendance was good. It was, of course, somewhat influenced by the world-wide depression, but we have reason to feel that the selection of Montreal was wise.

The exhibits were of high quality and attracted much attention.

The sessions were well attended and special interest was shown in those which have a direct practical application to everyday problems, such as the immunization against diphtheria, the protection of milk supplies, and education.

The Executive Board sanctioned the proposition of the Committee on Membership and Fellowship for a drive for Life Members, from which we expect great things. Advantages—both to Members and to the Association—of Life Membership, have already been explained in the September issue of this JOURNAL (page 1027). It may not be out of place here to call attention to the fact that the payments can be made in installments.

What we hope will constitute an outstanding feature of the JOURNAL in the future is the arrangement which has been made with Charles Porter, M.D., Editor of *Public Health*, the official publication of the Society of Medical Officers of Health of Great Britain, for a monthly letter. *Public Health* will also publish an American letter monthly, to which the members of the Editorial Board of our Association will contribute.

One cloud has caused a shadow on our Meeting: The sudden death of our President-Elect, William C. Hassler, M.D., who was to have been inducted into office at the meeting.

We have been fortunate in obtaining the services of Louis I. Dublin, Ph.D., Statistician of the Metropolitan Life Insurance Company, for the ensuing year, under whose administration the Association is sure of wise counsel and direction.

We regret that there was no representation from our neighbors to the South (Mexico and Cuba), which played such a large part in our last Annual Meeting. We especially hoped to have Rafael Silva, M.D., our First Vice-President and Director of the Public Health Department of the Republic of Mexico, with us. On the other hand, we have been fortunate in having a delegation from England and one of the most interesting sessions was devoted to a discussion of the public health program of that country. We also noted with pleasure the presence of Peter H. Bryce, M.D., a former President and one of our honorary Fellows, and probably the oldest member of the Association.

This meeting is the first in which Kendall Emerson, M.D., Acting Executive Secretary, has officiated. We congratulate him on the success of his efforts.

John A. Ferrell, M.D., Dr.P.H., of the International Health Board of the Rockefeller Foundation was made President-Elect, and Thomas Parran, Jr., M.D., Health Commissioner of New York State, Treasurer.

CITY NOISE

THE modern public health movement is being extended from time to time to embrace additional phases of urban environment, which have public health aspects. City noise is a newcomer in this field, although the din of urban life has long been an important aspect of our municipalities. The rapid growth of automobile traffic, building operations, rapid transit and the like, however, has focused attention upon the necessity of controlling preventable noises to make urban life bearable.

This problem is very complex, both from an administrative and technical standpoint, embracing certain aspects of housing and zoning, building and construction activities, traffic regulations and nuisances

under the police and sanitary codes, as well as several distinct fields of science.

The consideration of the problem in New York and Chicago has led to the appointment of special noise abatement commissions with power to investigate the causes and effects of unnecessary noises and to develop procedures for their control. The Noise Abatement Commission of the Department of Health of the City of New York has prepared a comprehensive report upon its work entitled "City Noise." A study was made of the intensity of various noises throughout the city with special apparatus developed by the Bell Telephone Company and others. This permitted the preparation of a "spot map" of noises, and the quantitative analysis of the intensity from various sources.

The studies reveal that about 85 per cent of noise in downtown New York City is due to street cars, elevated trains, and automobile traffic. The control problem is thus largely restricted to the field of transportation. More efficient and quieter automobiles, trucks, and street cars are being developed, but there is great need for concerted effort in maintaining present equipment in proper operating condition.

Other municipal departments are more directly connected with the underlying problems of traffic and building regulations than health departments, and hence the subject must be viewed in its broad aspect, and not merely from the standpoint of public health. Specialists are of the opinion, however, that excessive noise causes permanent deafness upon prolonged exposure, such as in noisy industries. This is said to be due to the injury of the nerve endings of the auditory nerve when the protective mechanism of the ear is fatigued through prolonged excitation, thus preventing compensation for variation in the intensity of sound. Other specialists have stated that nervous strain results from prolonged exposure to noise, seriously depleting vitality.

As far as is known no correlation has been made between these physiological and psychological effects of noise and the data collected in the scientific study of the intensity of noise from various sources. It seems to be impossible, therefore, at present to select an intensity value, or "noise level" which would separate noises of public health significance to the general public and those of no such importance.

It is evident that further studies of this complex subject are needed, and that at present the regulation of noise should be through special commissions empowered to act through the provisions of municipal ordinances similar to anti-smoke ordinances. In this way, it is not necessary to prove the public health significance of any specific noise or group of noises in order that they may be controlled or eliminated. Hence it is possible in the present state of knowledge to institute noise control measures.

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SIXTY-FIRST ANNUAL MEETING
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PUBLIC HEALTH ADMINISTRATION

HENRY F. VAUGHAN, D. P. H.

THE NEED FOR CONTINUED STUDY IN PUBLIC HEALTH WORK

IN *Public Health Reports* of July 24, 1931, Volume 46, No. 30, there is a most interesting and enlightening article by W. S. Leathers, M.D., Dean of the School of Medicine, Vanderbilt University, Nashville, Tenn. Dr. Leathers points out how easy it is for a health worker to become a mere routine worker, and urges that serious consideration be given methods for continued study in public health work. He lists a number of methods for continued study, among which are:

1. Every health worker should read and be informed on current literature bearing upon the particular field in which he is engaged. Every health department, whether it be state or local, should provide three or more journals in which papers are published dealing with general or special phases of public health work.

Among the journals of value to public health officials, he lists the *Journal of the American Medical Association*, the *American Journal of Public Health*, the *Journal of Preventive Medicine*, the various publications of the U. S. Public Health Service, particularly the *Public Health Reports*, *Public Health Bulletins*, and the National Institute of Health *Bulletins*. Listed as bulletins dealing with special phases of clinical medicine and public health are such journals as the *American Journal of Hygiene*, the *American Journal of Tropical Medicine*, the *Bulletin of Hygiene*, *Journal of Industrial Hygiene*, *Public Health* (official organ of the Society of Medical Officers of Health of England), *American Review of Tuberculosis*, *Tubercle*, the *Jour-*

nal of Social Hygiene, the *American Journal of Diseases of Children*. The nursing personnel of the health department should be especially interested in the *Public Health Nurse*, and the *American Journal of Nursing*. The journal *Municipal Sanitation* will be found useful in dealing with problems of sanitation, such as water supply, sewage disposal, refuse disposal, and such matters.

2. Each department of health should provide a library with books on public health. Dr. Leathers points out that it would seem legitimate to use the contingent fund of the budget, within limitations, for purchasing certain books or subscriptions to journals. These may be added to by special donations on the part of individuals in the communities, or social agencies, such as federated and civic clubs, and the local medical society. There should be some method of encouraging systematic reading on the part of the health personnel. A program of reading could be adopted by the health officer as well as by the nurse, the engineer, inspector, or other workers, and discussions could be stimulated bearing on certain subjects in weekly or biweekly conferences.

3. The personnel of state and local health departments should regularly attend the annual conference of the state health department. The writer points out that following these meetings one frequently enters upon his task with vigor, and with new perspective, which indicates the unquestionable value of contacts of this kind.

4. It is most desirable that health

officers, engineers, nurses, inspectors, and others engaged in health work, attend meetings from time to time, which may be of regional or sectional importance. Particular attention is called to the annual meetings of the American Medical Association, where many papers are read in the section of preventive and industrial medicine and public health, which are of much interest and practical importance in scientific public health. The meetings of the American Public Health Association, which afford splendid contacts in the various sections, would provide opportunity for one to follow his interest in special phases of public health.

Special attention is called to the great importance of attending local medical society meetings, and the annual meetings of the state medical association.

5. Every health worker should become interested in a special problem, and should study it with a view to preparing a paper for some scientific meeting.

6. Dr. Leathers calls attention to the fact that the average health officer is apt to do too much spontaneous talking without preparation, and points out how much better it would be if one

were to select a topic, read somewhat on the subject, and prepare in a concrete way certain items which are relevant and which are productive of thought in the listeners.

7. One very important phase of study or reading is the history of preventive medicine and public health. Attention is called to *A Half Century of Public Health*, published by the American Public Health Association, and to *Pioneers of Public Health*, by Mrs. M. E. M. Walker, with a foreword by Sir Humphrey Rolleston, of Cambridge University.

8. Some plan should be worked out by each state so that the personnel of local health departments can avail themselves of continued study in post-graduate courses in certain universities. Short intensive courses of this kind can be made most helpful and constructive in building up one's professional background. These courses are referred to in England as "refresher courses."

The article contains a very useful appendix of books which health departments ought to have in their libraries, on all the various subjects connected with public health and its administration.

THE PHYSICIAN AS HEALTH WORKER

IN 1928 the Detroit Department of Health inaugurated a plan of participation by the general medical practitioner in the public health program of the city. A beginning was made by eliminating all free clinics for diphtheria protection, and since that date all work has been done by the medical practitioner in his own office.

The enterprise has been carried out jointly through the Public Health Committee of the County Medical Society and the staff of the Department of Health. During the past winter, at ten

conferences on communicable disease control, there was an average attendance of 235 physicians, and one-third of the membership of the Medical Society attended some one of the lectures. Preventive medical activities can be transferred gradually to the physician only through close working harmony with medical organization. At present there are 1,100 physicians in Detroit, or approximately 90 per cent of those who would be interested, who are coöperating in the diphtheria prevention program. The results indicate that 80 per

cent of the school children, and 70 per cent of the preschool group have received protection.

In addition to sponsoring post-graduate medical conferences, the Department of Health has inaugurated a program of popular health instruction and a system of home visitation and instruction of parents by public health nurses. When able to do so, the parents pay the physician \$1 for each dose of toxin-antitoxin or toxoid and also \$1 for the Schick test. When, in the physician's judgment, the parent is unable or unwilling to pay, the Department of Health reimburses the physician at the rate of \$.50 for each treatment and \$1 for the Schick test. The material used is furnished without charge to all physicians, and in turn the latter reports each treatment by postcard to the Department of Health. On June 1 it was found that 52 per cent of infants between 6 months and 1 year of age had received protection, while for the preschool group 70 per cent had been protected. The co-

operating physicians have been paid a sum in excess of \$100,000 or an average of \$142 per physician.

Not only has the coöperative campaign resulted in the protection of a large number of children, but the diphtheria death rate has been reduced to one-fourth of the level existing prior to the beginning of the plan. The attitude of the medical profession toward the work of the Department of Health has been changed with the elimination of the antagonistic feeling which too frequently exists toward the work of the public health nurse. A beginning has been made toward the establishment of a health center in the office of each physician, and the opportunity is offered to expand the program of health conservation with medical coöperation into other fields such as tuberculosis and cancer control, periodic general examination, and the health of mothers and infants. By L. O. Geib, M.D., and Henry F. Vaughan, Dr.P.H.—*J. A. M. A.*, 97: 366 (Aug. 8), 1931.

LABORATORY

JOHN F. NORTON, PH. D.

ISOLATION AND CULTIVATION OF THE WHOOPING COUGH BACILLUS, *HEMOPHILUS PERTUSSIS*

JOHN HAYS BAILEY, PH. D.

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THE isolation of most organisms of the respiratory tract is dependent upon direct swabbing of the tract or recovery of the organisms from secretions of these organs. These methods are of great importance and yield very satisfactory results in diseases where the or-

ganism sought is located in regions easily reached by the swab, or where the secretions containing the organism can be readily collected.

In the case of whooping cough, however, if Mallory¹ be correct in his views on the pathological lesion in pertussis,

the organism is located below the larynx and, therefore, inaccessible to the ordinary swab. The use of sputum for isolation of *Hemophilus pertussis* is not entirely satisfactory, as most small children swallow any sputum expelled in a paroxysm. Also, since the organism is found deep in the trachea and bronchi, the easily expelled sputum—that from the upper portion of the respiratory tract—would not be expected to contain the organism, necessitating obtaining the thick, ropy mucus that is finally expelled before any hope of finding the organism may be entertained.

These difficulties can in a large measure be overcome by the use of the cough plate method of isolation of the *H. pertussis* devised by Chievitz and Meyer in 1916.² Plates containing Bordet-Gengou medium are held 3 to 4 inches from the mouth of the coughing patient. Merely asking the patient to cough and exposing the plate during such an effort will not yield good results. The exposure must be made during a genuine paroxysm. After exposure the plates are incubated for 3 days. At the end of that time they are examined for colonies of *H. pertussis*. These are found to be small, grayish-white, somewhat glistening, translucent, raised colonies, usually surrounded by a dark zone of hemolysis. This latter condition is by no means constant. The colonies may be readily picked off the surface of the medium.

Suspicious colonies are then examined by a Gram stain. It is very dangerous to make a diagnosis of a positive cough plate by cultural characteristics alone. Not infrequently pure cultures of *H. pertussis* are obtained by this method, although as a rule the plates contain large numbers of saprophytic bacteria. Indeed it is the saprophytes of the respiratory tract that offer the most serious handicap to the isolation of *H. pertussis* by overgrowing the entire plate in the time necessary for the growth of

the latter, and crowding out or obscuring the pertussis colonies. This handicap may to a certain extent be overcome by proper exposure of the plate.

By allowing the paroxysm to continue to a deep bronchial expulsive effort and then exposing the plate, the saprophytes are largely washed out of the mouth and upper trachea, and the organisms contained in the air or droplets of the final efforts may be deposited upon the plate. It is just here that most failures of the cough plate method occur. If the plate be exposed before the saprophytes are washed out the result is likely to be an overgrown plate. With a little experience no difficulty is encountered in obtaining positive cough plates during the favorable period of the disease, that is during the first 2 weeks. In practice, plates should be exposed in duplicate, affording a better chance of obtaining the organism. If one of the plates is positive the other need not be examined.

The medium used by Chievitz and Meyer was the original Bordet-Gengou medium—a glycerinated extract of potato with horse blood in place of the rabbit or human as recommended in the original.

We have found a modification, developed in Madsen's laboratory, of the original Bordet-Gengou medium to give the most satisfactory results. Pared potatoes are cut into thin slices. To one kg. of potato are added 2,000 c.c. of water and 80 c.c. of C.P. neutral glycerine. This is boiled over a free flame until the potato falls to pieces, the water lost by evaporation being replaced. The material is then rubbed through a sieve and strained through a towel. The expressed juice is then adjusted to a pH of 7. To 1 part of neutralized juice (it is rather thick) is added 3 parts of 0.6 per cent sodium chloride solution. The material is then distributed in 200 c.c. lots into 500 c.c. flasks. To each flask is added 8 to 10

gm. of agar. The flasks are then plugged and set in the ice chest over night. If powdered agar is used it is not necessary to store over night. The flasks are then autoclaved at 15 lb. pressure for 30 minutes. When plates are to be poured the agar is melted and then cooled to about 40° C. Two hundred c.c. of sterile defibrinated horse blood, warmed to about 40°, is added and thoroughly mixed. To the resulting mixture 6 c.c. of sterile N/2 lactic acid is added and mixed. Plates are then poured and one plate is incubated for 2 to 3 days to test the sterility. This plate is not used again.

Plates of this medium may be stored in the ice chest for 2 weeks. It is important that the agar be not too hot at the time the blood is added, as *H. pertussis* grows only on unaltered hemoglobin. Indeed this fact has been used as a method for identifying *H. pertussis* and differentiating it from *B. influenza*; the latter grows on chocolate agar, the former will not until after several generations on artificial medium.

When cough plates are to be used in a hospital or institution the usual Petri dish is used, but where the plates must be sent some distance to the laboratory these are, of course, out of the question. An aluminum dish, 90 x 10 mm. in height and resembling the usual Petri dish, is very satisfactory for use as a cough plate. It is easily handled, is about the weight of the glass dish, and cannot be broken. Steam will corrode the dish, but, after soaking in 3 per cent phenol, rinsing and drying, it may be sterilized in the hot air oven at 200° to 250° C. The usual culture box as used in diphtheria diagnosis or the tin ointment boxes used for the same purpose are not as satisfactory as the larger dish, though they may be used.

It is true that these small boxes save the culture medium, and do not allow the medium to dry out as do the other dishes, but the surface of the medium

exposed to the expelled air at the time of exposure of the plate is so limited that the chances of getting a positive plate are much decreased. The small surface also allows a more ready overgrowing of the plate by saprophytes. The tight fitting covers, while keeping the medium in good condition, make it difficult to open the box to expose it. Of course, the metal dish has a big disadvantage in that it is impossible to see the medium without opening it, thus risking air-borne contaminants. With the glass Petri dish, overgrowing may be prevented to a large extent by cutting out, with a sterile instrument, colonies that are spreading so rapidly that there is danger of overgrowing.

While blood is absolutely essential in the culture medium for the isolation of *H. pertussis*, it is not necessary after a few generations on Bordet-Gengou medium. An excellent medium for growing *H. pertussis* is one containing equal parts of Bordet-Gengou stock, nutrient agar and horse blood. Two hundred c.c. of nutrient agar and 200 c.c. of Bordet-Gengou stock are pooled and sterilized. When cooled to about 40° C. 200 c.c. of sterile defibrinated horse blood are added. The pH of the nutrient agar is about 7.8. *H. pertussis* can be grown on this medium directly from the cough plates; in addition it is an excellent one for growing the organism for vaccine.

After several generations on an artificial medium, good growths may be obtained by using any of the following agars: brain, chocolate, hormone, ascites, or veal infusion. The first and last named mediums are to be recommended for the ease in preparation and sterilizing.

The brain agar, suggested by Pelouze and Viteri³ for the culture of gonococcus, is to be highly recommended. Their directions are as follows: 500 gm. of calf brain are forced through a wide meshed wire gauze into 500 c.c. of dis-

tilled water. This is allowed to infuse 24 hours in the ice chest. It is then slowly brought to 75° C., kept there for 30 minutes and then put through several cotton filters of varying thickness. The filtrate will always be turbid. To this is added sufficient acid sodium phosphate and peptone to yield a 0.5 per cent and 1 per cent solution respectively. This is the stock and is autoclaved for 20 minutes at 15 lb. pressure. To complete the medium 1 part of the stock brain broth is added to 3 parts of standard 1 per cent peptone veal broth agar. The agar should be 3 per cent* and the pH adjusted to 7.8. The medium is then tubed and autoclaved. The original method did not allow heating the brain infusion, but this practice does not interfere with the growth of *H. pertussis* and is a big aid in the filtering of the infusion.

The growth of *H. pertussis* on veal infusion agar is less luxurious than on the other medium but it may be enhanced by the addition of glycerine. This medium is the one in routine use

* The original method calls for 2.5 per cent agar, which when diluted gives too soft a medium.

for stock cultures of *H. pertussis* in this laboratory. It is essential that the broth be as free from fat as possible, so the meat is purchased in chunks, never ground, and the fat removed in the laboratory. The infusion is made to contain 2 per cent peptone, 5 per cent glycerine, 0.5 per cent sodium chloride and 2.5 per cent agar. The pH is adjusted to 8.0 and the medium sterilized, filtered through cotton, tubed and re-sterilized at 15 lb. for 30 minutes. The final pH is 7.6.

Certain veal known to the packers and butchers as "red" has, in the experience of this laboratory, been less satisfactory for pertussis culture medium than the so-called "white" veal. Calves that have been shipped some distance and then slaughtered, particularly those that have had a milk deficient diet, give "red" veal. Some veal may be of such a deep color it resembles beef; such veal is all but useless for pertussis culture medium.

REFERENCES

1. Mallory, F. B., and Horner, A. A. *J. Med. Res.*, 27: 115, 1912.
2. Chievitz, Ingeborg, and Meyer, Adolph. *Ann. de l'Inst. Pasteur*, 30: 503, 1916
3. Pelouze, P. S., and Viteri, L. E. *J. A. M. A.*, 86: 684, 1926

VITAL STATISTICS

LOUIS I. DUBLIN, PH. D.

Vital Statistics for Georgia, 1930—For the calendar year, 1930, there were registered in the State of Georgia 60,318 live births, corresponding to a birth rate of 20.7 per 1,000 population. This represents an increase of 1,804 births over the number (58,514) of births registered in 1929. The total number of deaths reported for 1930 was 35,188, corresponding to a death rate of 12.1 per 1,000 population. This rate represents a slight decrease (0.8 per cent) over the rate (12.2) recorded in 1929. The annual average number of deaths reported in the last 10 years in Georgia was 32,981, representing an annual average rate of 11.4. Death rates for the past 10 years show an annual average increase of 0.1. Stillbirths, numbering 3,796 or a ratio of 6.3 per 100 live births, showed an increase of 255 over the number registered in 1929. The number of deaths of infants under 1 year of age registered in 1930 was 4,713, corresponding to an infant mortality rate of 78.1 per 1,000 live births, as compared with 4,469, or a rate of 76.3 in 1929, the 1930 rates showing an increase of 2.4 per cent over the 1929 rate.

Among the communicable diseases, smallpox with no deaths in 1930, malaria with a death rate of 15.2 in 1930 as compared with 23.3 in 1929, diphtheria with a 1930 rate of 4.6 as against 6.3 in 1929, and influenza with a rate of 33.1 in 1930 as compared with 87.5 in 1929, showed the most striking reductions in death rate. On the other hand, typhoid fever and measles showed increases from 11.7 and 1.1 respectively in 1929 to 16.9 and 4.4 respectively in 1930.

Heart diseases with a rate of 140.7 in 1930 and nephritis (129.9) were the leading causes of death in 1930, heart disease having shown a marked increase from the 1929 rate of 126.9, and nephritis a marked decrease from the 1929 rate of 137.7. Cancer (53.3), diabetes (12.1), cerebral hemorrhage, softening (87.0), pneumonia—all forms (88.5), diarrhea and enteritis—2 years (24.7), and other puerperal causes (17.1) were most important among the diseases showing increases in 1930 over 1929, while pellagra (24.5) showed a considerable decrease. The tuberculosis decline from 75.3 in 1929 to 74.6 in 1930 is noteworthy.—*Official Bulletin on Biennial Report of the State Board of Health of Georgia, 1929-1930*, pp. 65-75.

Some Vital Statistics for Pennsylvania, 1928-1930—According to the biennial report of the Department of Health, the birth rate of Pennsylvania, with its population of approximately 10,000,000 people, has been falling for the last 25 years, with a temporary increase in the year 1920 and in 1921 following the return of the men who were in the Army. In 1910 there were 7,600,000 people in Pennsylvania. With that population there were 203,510 babies born during the year, corresponding to a birth rate of 26.5. In 1929 there were 189,524 live births with a rate of 19.6 per 1,000 population. There has been a corresponding decrease in marriages, which have fallen from a rate of 16.2 per 1,000 population to 14.2 in the 20 years indicated.

In 1929 there were 117,365 deaths, bringing the death rate to a new low

level of 11.9 for the State of Pennsylvania. It is interesting to note that despite the great increase in population from 1910 to 1929, there were actually more deaths (119,815) from all causes in 1910 than in 1929.

The infant mortality rate in Pennsylvania has been reduced from 167 per 1,000 living births in 1906 to 71 in 1929 and the indications point to a further reduction when the records of 1930 are complete.

Among the contagious diseases, typhoid fever has become practically a negligible factor. In 1906 there were 3,917 deaths from typhoid, in 1929 only 201 individuals died from this disease, giving a mortality rate of 2.0 per 100,000 and a morbidity rate of 12.7, the lowest in the history of the state. The 6 months of 1930 show a further reduction with a mortality rate of 1.1 and a morbidity rate of 6.3 for the half year.

Only 1 death from smallpox has been reported in Pennsylvania since August, 1925. In 24 years of registration in Pennsylvania there have been 9 years in which not a single death from smallpox has been reported. The year 1929 established a new record in diphtheria both in the death rate and in the case rate, the former dropping to 6.9 per 100,000 population and the latter to 75.0. This can be compared with the year 1921 when there were 20,910 cases and 1,983 deaths, while in 1929 there were only 685 deaths and 242 in the first 6 months of 1930. In 1929 there were 7,422 cases of diphtheria and in the first 6 months of 1930 there were 3,462.

The maternal death rate for 1928 was 5.8 per 1,000 births; for 1929 it was 6.1. This is an apparent rather than an actual increase due to the fact that it is rated on the number of births and this number has been decreasing, but at the same time an analysis of the record shows that there has been no definite im-

provement in lessening the perils of women at childbirth in recent years.

Deaths from all accidental causes in Pennsylvania continue to increase, but if those caused by automobiles are removed, the industrial deaths show a very definite decrease.—Commonwealth of Pennsylvania. *Biennial Report of the Department of Health, 1928-1930*, pp. 6-9.

Population of the United States by Sex, Color, and Nativity, 1930—As shown by the Fifteenth Census, the total population of the United States on April 1, 1930 (122,775,046), comprised 62,137,080 males and 60,637,966 females, or 102.5 males per 100 females. In 1920 there were 53,900,431 males and 51,810,189 females, or 104.0 males per 100 females. The number of males in 1930 exceeded the number of females by 1,499,114, and in 1920 by 2,090,242. These figures would indicate that the female population had increased somewhat faster than the male population.

The native white population of native parentage comprised 48,010,145 males and 47,487,655 females. There were thus 101.1 males per 100 females, which may be compared with 101.7 in the same class in 1920. Among the native whites of foreign or mixed parentage there were 12,550,144 males and 12,811,042 females, or 98.0 males per 100 females, as compared with 98.6 in 1920. The foreign born whites comprised 7,153,709 males and 6,212,698 females, or 115.1 males per 100 females, as compared with 121.7 in 1920. The 1920 sex ratios for native whites of foreign or mixed parentage and for foreign born whites are made slightly higher by the inclusion in that year of persons who would have been classified in 1930 as Mexican. The effect of this inclusion is so slight, however, that it has not been thought worth while to present adjusted figures for comparison.

The Negro population comprised

5,855,669 males and 6,035,474 females, or 97.0 males per 100 females, as compared with 99.2 in 1920. The sex ratio (males per 100 females) for the Mexican population in 1930 was 114.3; for the Indian population, 105.1; for the Chinese, 394.7; and for Japanese, 143.3.

There are considerable differences in the sex classification of the population as among the three general sections of the country—the North, the South, and the West.

The number of males per 100 females in the North in 1930 was 102.2, or practically the same as for the country as a whole. In the South the number of females was relatively higher, the sex ratio being 100.9. In the West the number of males was relatively much larger, the sex ratio being 109.5. For the native white population of native parentage, the sex ratio in the North was 101.6; in the South, 102.2; and in the West, 106.0. For the foreign born whites the differences are more pronounced, the ratio for this class in the North being 112.3; in the South, 130.2; and in the West, 133.9.

Among the Negroes in the North there were 101.0 males per 100 females; in the South, 95.9; and in the West, 104.1. The somewhat higher ratios shown for the North and the West indicate that in the migration of Negroes from the South, males have been somewhat more numerous than females, though the excess is not very great.

While the number of Mexicans is relatively small as compared with the other races, the differences in the sex ratios in the different areas are interesting. In the North there were 65,451 males of this race and 39,535 females, or 165.6 males per 100 females. In the South (the Mexicans in this section being mainly in Texas) the sex ratio was 106.1, and in the West, 116.9.—Department of Commerce, Bureau of the Census, Population U. S.—3, Aug. 18, 1931.

Statistical Notes on the Census for England and Wales, 1931—The total population enumerated in England and Wales as at midnight on Sunday, April 26th, 1931, according to preliminary summaries furnished by local Census Officers, was 39,947,931 persons, 19,138,844 being males and 20,809,087 females.

The present total is the largest hitherto recorded in England and Wales; and the areal density it represents, viz., 685 persons per square mile, is, with a possible exception in the case of Belgium, far higher than that of any country of which the Census Office has record—much more than double that of a large majority of other countries.

The 1931 total population exceeds that returned at the previous enumeration of the 19th of June, 1921, by 2,061,232, corresponding to an intercensal rate of increase of 5.44 per cent, or, if allowance is made for the 54 days by which the intercensal period falls short of the full 10 years, a decennial rate of increase of 5.52 per cent. The numerical increase is less than that of any decennium since 1861 (when the population was half its present dimensions) with the sole exception of the war decade 1911–1921; while the percentage increase, with the same exception, is only half or less than half of any previously recorded. But for the exceptional loss of men during the war the present decennial rate of increase would have been the lowest recorded for England and Wales since Census taking was introduced in 1801.

In spite of the fact that marriage rates have been well maintained, particularly at the younger ages at which the bulk of births occur, and of the further fact that the exceptional post-war spurt in the birth rate itself had only just passed its maximum at the beginning of the decennium, the total births registered in the 1921–1931 intercensal period are more than a million and a

quarter (16.3 per cent) fewer than in the preceding period—a period which covered the war years when the birth rate sank to levels never before recorded in the country. They are between 2 and 2½ millions (25.4 per cent) fewer than those of the last completely normal decennium 1901–1911.

The almost unbroken fall in the birth rate during the past 10 years has reduced it to a level of 16.3 per 1,000 population, a figure which is only half, or less than half that experienced prior to 1890 and only about two-thirds of that recorded in pre-war years. With the exception of Sweden, England and Wales now has a lower birth rate than any other country; and the present rate is definitely insufficient to maintain a stationary population in the future. It has been suggested that a current birth rate of about 19½ per 1,000 population would be necessary if a future decline in population were to be avoided. The actual level at the moment is 16 per cent below this standard.

As a partial off-set against the decline in births, the deaths registered on the intercensal period were more than ½ million fewer than those of either of the two preceding decennia. This numerical reduction of more than 10 per cent, if allowance is made for the increasing age and numbers of the population exposed to risk, represent a reduction in true mortality of more like 20 per cent compared with the decennium 1911–1921 (exclusive of deaths on active service) or 30 per cent compared with the last pre-war decennium, 1901–1911.

The movement of population other than that accounted for by the difference between births and deaths has been outward on balance and has resulted in a loss of population amounting to 177,000 persons.

In each of the regions of England and Wales except South Wales (W. I.) the population of 1931 is greater than it

was in 1921. The variations range from an increase of 10.5 per cent in the South Eastern section to the decrease in South Wales of 3.6 per cent, both these extremes standing prominently apart from the movements in the intermediate areas, of which only one (M. 2) is just above, while eight are below, the national average.

The most striking contrast in the current increases stands in relation to those of 10 years ago. The areas associated with mining and heavy manufacturing industries which produced the largest population growths in 1911–1921 now take up positions at or near the bottom of the list, notwithstanding their relatively high birth rates, whereas the South Eastern region now outstandingly at the top formerly registered an increase below the general average. Considerable retardation of growth is recorded in the northern textile regions; but on the other hand the increases in the rural counties of the East and South West—especially the latter—show definite acceleration, though they are still under average.

Of the urban and rural administrative areas into which the country is divided, the population of the 1,120 urban areas (including County and Municipal Boroughs and counting the Administrative County of London as one district) amounted in all at the date of the census to 31,948,166 persons while the population of the 638 Rural Districts amounted to 7,999,765, so that the proportions now living under urban and rural conditions may broadly be regarded as 80 and 20 per cent respectively.

The subdivision of the urban population into a large number of separate units discloses, as might have been expected, a wide range of increase and decrease variations. During the period 1921–1931, 14 towns have more than doubled their populations; in these the increases rise to the extraordinary per-

centages of 796 in Kingsbury (Middlesex), 879 in Dagenham (Essex) and 1,019 in Welwyn Garden City (Herts). On the other hand the number and magnitude of the decreases now recorded are much greater than they were 10 years ago. In 468 towns the populations have fallen, the loss exceeding 20 per cent in twenty areas, as compared with 370 and 6 respectively in the preceding period. But here, again, caution must be used in comparing census populations, for, as indicated above, it is necessary to bear in mind that many seaside and holiday resorts were inflated by temporary visitors in 1921 owing to the postponement of the census of that year to the middle of June, with the result that the progress of such areas will be underrated by their latest figures to the extent to which it was overstated in 1921.

More than one-half of the total population of the country is aggregated in comparatively dense units containing more than 50,000 each, and one-half of this population or one-quarter of the whole is to be found in the 13 largest towns (counting London as one) with

populations exceeding a quarter of a million.

The preponderance of females over males, which rose from an excess of 1,179,276 in 1911 to 1,736,221 in 1921 as a direct result of the loss of men during the war, has fallen in the last 10 years to 1,670,243. The exceptional war element will, of course, be visible in the population figures for many decades to come; it will, however, occur at increasingly older ages and at the present time is located mainly between the ages of 30 and 55 instead of between 20 and 45 as at the census of 1921. The excess in all cases is obtained from the number of the sexes enumerated within the country, and omits from account members of the armed forces and of the mercantile marine absent from the country on census night. The present excess represents a ratio of 1,087 females to 1,000 males. It is higher than any corresponding ratio prior to 1921 and compares with a pre-war ratio of 1,068.—Census of England and Wales, 1931, *Preliminary Report*, pp. x-xxi, Aug.

PUBLIC HEALTH ENGINEERING

ARTHUR P. MILLER, C. E.

EFFECTS OF MANGANESE ON FILTER OPERATION

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THE appearance of manganese in the surface water supplies of northern West Virginia has been closely allied with the development of bituminous coal mining and the subsequent acid drainage entering the streams. It was first noticed in the color of the sand grains in the filter beds. The sand appears black when wet but its color changes to a dark brown when dry. After the filter has colored, the tubes of the chlorinators darken, and deposits of manganese collect on all parts exposed to water and chlorine.

Three filter plants all of which are located on the Monongahela River watershed in West Virginia were selected as a basis for the facts in this paper. Plant No. 1 of Weston takes its water supply from behind a low dam across the West Fork River. This supply is badly polluted with sewage.

Plant No. 2 at Clarksburg is about 25 miles down stream from Plant No. 1 and takes water from the same stream. Several small towns empty untreated sewage into the river. Also a number of bituminous coal mines discharge acid drainage into the stream above the water intake.

Plant No. 3 at Morgantown on the Monongahela River is about 40 miles down stream from Plant No. 2. It receives the untreated sewage from 100,000 people together with a large amount of acid mine drainage so that during times of low flow the water is practically sterile.

EXAMINATION OF FILTER SANDS

During the past summer samples of sand from each of the three filter plants were collected and tested. Table I gives the results. Unfortunately the mechanical analyses of the sands at the time they were placed in the filters were not available, but certainly the effective sizes were much lower when the filters were first placed in operation.

TABLE I

Plant No.	MECHANICAL ANALYSIS OF FILTER SANDS		CHEMICAL ANALYSIS	
	Effective Size mm.	Uniformity Coefficient	Manganese %	Calcium %
1	0.51	1.53	0.50	0.48
2	0.60	1.38	1.10	0.12
3	0.63	1.65	0.51	0.52

The manganese and the calcium contents were based upon the total weight of the sample and it is easy to account for the high effective size.

All three plants use lime and alum for coagulation and are operated by competent men. The effective size of sand increases with each plant while the manganese content at Plant No. 2 is the highest. The water used by Plant No. 3 has been diluted by several streams after leaving Plant No. 2.

EFFECTS ON OPERATION

The manganese content of the raw water at Plant No. 2 rose from 1.0 p.p.m. in June to 2.0 in August and continued at that figure until December when it jumped to 3.0 and remained there until flood stage on January 6.

Unfortunately these three plants do not make the test for manganese as a routine test and it is not possible to say what part of the time manganese is present in the raw water. The writer has tested the raw water at each source a number of times and always found at least a trace present. The Monongahela River has a manganese content of from 5 to 12 p.p.m. during times of low flow.

A large amount of manganese is deposited on the filter sand but some goes through as shown by the black deposit on the chlorine machine.

The removal of manganese is effected by the elimination of all free carbon dioxide and carrying the applied water with a pH value of about 8.3. Possibly, now that the filters have become encrusted with manganese, the water, in passing through, takes up the manganese, especially when free CO_2 is present in the water.

As all of these plants use alum for coagulation at least a part of the manganese in the finished water is a result of this re-solution. Mr. Boynton, at Clarksburg, writes:

We are dosing for turbidity once more and so cannot dose with lime as heavily as in times of drought, but I am adding lime before filtration, to phenolphthalein alkalinity of 5-8 p.p.m., to remove small amounts of manganese and to prevent re-solution of same from filters.

Morgantown did not have trouble with manganese after they increased the lime dosage so that the water on top of the filter had a few parts per million of phenol alkalinity. At Weston very little trouble has been experienced with manganese in the effluent.

Chlorination of the raw water in doses as great as 5 p.p.m. does not oxidize the manganese. Laboratory as well as plant tests indicate that lime in sufficient quantities to remove the CO_2 and bring the pH value above 8 will cause the manganese to be precipitated. The filter operator must use this heavy dosage of lime or it will be carried over onto

the filters. This deposit will, as stated before, encrust the sand grains and with accompanying growths of slime and bacteria, shorten filter runs and lower the rate of filtration.

EFFECTS OF FILTRATION

At the Weston plant the filters are badly caked. The filters are washed by applying air and then water at a high velocity. The capacity of the sewer is not large enough to take care of the quantity of wash water and the water at times during washing is a foot over the wash water gutters. The filters are not equipped with loss of head gages and during the summer they were washed shortly before the filters were placed in operation. There is adequate filter area, so the effects of poor washing are minimized by the slow rate of filtration. During idle periods gas bubbles come up through the filters. The bacteriological results on the effluent are usually good, but during the summer months the effluent had a disagreeable decayed vegetable taste. The sand has been recently renewed and more tests will be made later.

At Clarksburg the filters are in excellent condition and the only apparent bad effect of the manganese has been its occasional presence in the filtered water. Mr. Boynton writes:

Up to the present time no decrease in efficiency of the sand beds has been manifest, the water passing through clear and sparkling and of low bacterial content. *B. coli* is not found with increasing frequency in the effluent, but in varying numbers, according to the load, as was the case when the sand was clean.

At all times the bacteriological quality of the Clarksburg water is excellent.

At Morgantown the total count in the raw water during the times of low flow is so low that it is not possible to detect any ill effects of the manganese deposits on the sand grains. The river water is usually sterile and its turbidity 0. The pH frequently is as low as 3.0.

CONCLUSIONS

1. The increase in size of sand grains due to deposits of manganese probably decreases the efficiency of filtration, but the load on the filter plants studied is not sufficient to make an unsafe effluent.

2. Elimination of free CO_2 and the addition of lime to bring the pH up to about 8.3 will cause the manganese to be deposited in the basins.

3. After the sand grains have become coated with manganese, water containing free CO_2 will dissolve some of this deposit and cause manganese to appear in the effluent.

4. More data are needed on the safe load on a rapid sand filter when the effective size has been increased by manganese deposits.

FOOD, DRUGS AND NUTRITION

WALTER S. FRISBIE

Antirachitic Potency of the Milk of Cows Fed Irradiated Yeast or Ergosterol—The experiment here reported was carried out on cows in a large model dairy herd. They were divided into 5 groups, 2 of which received fodder supplemented with irradiated ergosterol, 2 fodder supplemented with irradiated yeast, and 1 served as a control. The cows were confined to their stalls at all times so that sunlight played no rôle in the results.

One group received the equivalent of 100,000 rat units of irradiated ergosterol in the form of viosterol—a solution of this sterol in corn oil. Another group received 200,000 rat units of viosterol. Two other groups were given supplements of irradiated dried brewer's yeast, one the equivalent of 30,000 rat units a day and the other the equivalent of 60,000 rat units. The fifth group or control received only the basal diet.

Infants, 4 groups of about 25 each, were given the milk from these cows, 2 of the groups receiving the "irradiated ergosterol milk" and 2 the "yeast milk."

Before the tests were begun a care-

ful examination was carried out with especial attention to the presence of rickets. The test was carried out for 3 months, and although the main object was the prevention of rickets, the investigation also afforded an opportunity for a curative test as at the beginning 13 infants were found to have roentgenologic rickets and 36 some evidence of clinical rickets.

Of the 4 test milks given, all except the weaker "yeast milk" were found to prevent as well as to cure rickets. In cases in which rickets was already present the milk brought about calcification within a month. From the point of view of the number of antirachitic rat units fed to the cow, the irradiated yeast induced a more potent milk than the viosterol. The outstanding advantage of this method of antirachitic therapy is that it functions automatically.—A. F. Hess, J. M. Lewis, F. L. MacLeod and B. H. Thomas, *J. A. M. A.*, 97: 370 (Aug. 8), 1931.

Salmon Poisoning—This disease of the *Canidae* occurs in western Oregon, northwestern California, and southwestern Washington. Apparently this disease has been indigenous to this region

before it was settled by whites. One of the authors had previously reported that this disease was associated with infestation with an intestinal fluke, an encysted form of which occurred in fish.

This paper reports an extensive investigation of the cause and nature of salmon poisoning. Attention is given to the description of the fluke and its life cycle based on field studies which revealed the identity of the snail host. The distribution of this snail was found to be practically identical with the distribution of salmon poisoning. Encysted flukes were found present in salmon and trout only in fresh water where the snail host was always present.

The authors succeeded in experimentally infesting fish with the parasite by contact with the snail host under controlled conditions. Field studies indicate that fish may become infested during any season of the year. All genera and species of the family *Salmonidae* occurring in western Oregon streams have proved to be hosts of this fluke.

Studies of the pathogenicity of the parasite show that in dogs, foxes, and coyotes, a typical syndrome follows the consumption of infested salmon and trout.

Numerous experiments were carried on to study the nature of the disease. The symptoms, pathology and immunology are given in detail and are suggestive of an infection. While it is apparent that ingestion of parasitized fish and subsequent infestation is a predisposing cause of the disease, the specific cause was not demonstrated.

Experiments were also conducted which showed that injections into experimental animals of large numbers of parasites heated at 60° C. for 1 hour, at 100° C. 4 minutes, and 100° C. 3 minutes, did not produce any symptoms of salmon poisoning. The same experiments in which parasites held at low temperatures were used also failed to

produce symptoms in experimental animals.

In summarizing their work the authors concluded:

1. Salmon poisoning is a disease of *Canidae* associated with the trigenetic intestinal fluke *Nanophyetus salmincola* Chapin.

2. The flukes reach maturity in from 5 to 7 days in the mammalian host.

3. The snail host is *Goniobasis plicifera* var. *silicula* (Gould). The fish hosts include salmon and trout from western Oregon. The mammalian hosts include dogs, foxes, coyotes, racoons, bobcats and minks.

4. Of the mammalian hosts only the *Canidae* develop the disease.

5. The specific cause of salmon poisoning is unknown.

6. The disease has a definite incubation period, followed by typical acute symptoms, and high mortality. Significant pathological lesions are limited to the digestive tube.

7. No satisfactory treatment has been found.

8. Recovery is followed by a definite immunity.

9. Attempts at producing immunity have been unsuccessful.

10. Interperitoneal injections of mature flukes resulted in producing symptoms similar to those produced by eating parasitized fish.

—B. T. Simms, C. R. Donham, and J. N. Shaw, *Am. J. Hyg.*, 13: 2 (Mar.), 1931.

Studies in Nutritional Anemia. Quantitative Variations in Iron, Copper, and Manganese Supplements—An extensive series of experiments was undertaken by the authors in an attempt to explain the discrepancies in results reported previously by several investigators. Secondary anemia was produced in young rats by feeding fresh milk from the time of weaning. Aluminum and block tin were the only metals which came in contact with the milk before feeding. Hemoglobin determinations were made weekly on each animal until a normal level was reached, after which bi-weekly determinations were made. Tables and charts are given summarizing the results obtained.

There was found to be slow but definite hemoglobin response to pure iron salts. The response is directly proportional to the amount of iron fed within the limits tested in the experiment. The optimum daily dose of copper for a rat appeared to be between 0.1 and 1.0 mg. daily.

Manganese fed in 0.1, 0.05, 0.025, and 0.01 mg. doses daily has a negligible supplementary action to iron in hemoglobin synthesis, but may have a slight stimulating effect on growth and food intake. Higher doses of manganese are being investigated further.

The optimum daily iron requirement for a rat is around 0.25 mg. if sufficient copper supplement (0.1 mg. daily) is provided.

When recovery from a nutritional anemia is the experimental procedure a uniformly low initial hemoglobin in experimental animals is essential for consistent results.—Helen S. Mitchell and Lila Miller, *J. Biol. Chem.*, 92: 421 (July), 1931.

The Basal-Metabolic Rates of Vegetarians—Previous work (Benedict and Roth, *J. Biol. Chem.*, 20: 231, 1913) has indicated that there is little, if any, difference between the basal-metabolic rates of vegetarians and non-vegetarians.

In the work here reported, the group

chosen for study consisted of nurses, between the ages of 18 and 25, in training at a vegetarian sanitarium and living under uniform conditions of diet, work and general environment. No subjects who were more than 10 per cent over or under weight, or who showed symptoms of poor health or other abnormality, were included in the group. The Du Bois standards of normality were used as the basis of comparison.

Five girls were classed as life-long vegetarians, having never eaten meat of any kind in their lives. Their average basal-metabolic rate was 14 per cent below the normal of Du Bois. Ten girls were classed as long-time vegetarians, having been non-meat-eaters for 5 years or more. Their average basal-metabolic rate was 12 per cent below normal. To check this, the basal-metabolic rates of 26 non-vegetarian girls were determined, with the same apparatus and under conditions as nearly parallel as possible. Their average basal-metabolic rate was 4 per cent below normal.

Comparison of these results with the basal-metabolic rates of short-time vegetarians seems to show that a long period of vegetarianism is necessary if the rate is to be noticeably reduced.—Glen Wakeham and Louis A. Hansen, University of Colorado, *Science*, 74: 70 (July 17), 1931.

INDUSTRIAL HYGIENE

EMERY R. HAYHURST, M. D., PH. D., AND LEONARD GREENBURG,
M. D., PH. D.

Toxicity of Methyl Alcohol (Methanol) Following Skin Absorption and Inhalation—This is a progress report with a comprehensive bibliography and reference to a more extensive separate bibliography and concerns an experimental study of the toxicity of methyl alcohol using 265 animals, including monkeys, rabbits and rats. The materials for test purposes included crude, 95 per cent, and highly purified natural and also synthetic methyl alcohol derived from three sources of manufacture.

In the skin absorption experiments, the alcohol was applied under conditions that precluded inhalation. Methyl alcohol so applied invariably led to damage consistently like that arising from the oral intake of this substance. Methyl alcohol was likewise recovered on the distillation of all organs. The threshold of danger following skin absorption was found to be near 0.5 c.c. per kg. of animal weight, applied 4 times daily. It was found that 1.3 c.c. per kg. of weight will produce death within 48 hours, when such applications are made at the rate of 4 per day.

If these results obtained from monkeys may be applied to man, approximately 1 oz. (31 c.c.) of methyl alcohol repeatedly in contact with the human body, under conditions favorable to retention and evaporation, constitutes a threat to well-being.

Inhalation experiments were also carried out with the three kinds of animals mentioned, in concentrations ranging from 1,000 to 40,000 p.p.m. of methyl alcohol vapor. All of these concentra-

tions have produced death among exposed animals.

One thousand p.p.m. of air have killed some, but not all animals, the shortest exposure time being 41 hours, at the rate of 18 hours per day. Rabbits, and particularly black rabbits, are much less susceptible to the action of methyl alcohol than other animals. Marked variations in individual susceptibility have been observed.

An exposure of 1 hour daily to 40,000 parts of methyl alcohol vapor per million of air causes scant evidence of immediate impairment among animals, but eventually kills. Four hours of such exposure promptly kills all animals. It was also found that the inhalation of methyl alcohol has regularly yielded methyl alcohol on distillation of organs, blood, urine, muscle tissue, etc.

The threshold of danger by inhalation is well below 1,000 p.p.m. of methyl alcohol vapor. If this degree of toxicity obtained from monkeys applies to man, the vapors from 1 oz. of methyl alcohol entering the human body constitute a threat to life even when the exposure is distributed over 2 or 3 days.

A later publication will report details upon tissue pathology, although note is here made of extensive peripheral nerve damage.

On a basis of exposure, c.c. for c.c., methyl alcohol is at least as toxic through inhalation or skin absorption as it is following oral intake.

In view of the very small amounts necessary to produce dire clinical conditions and death in animals most like men, it is reasonable to assume that practical hazards for human beings may be produced under conditions of apparently trivial exposures.—

Carey P. McCord, *Indust. & Eng. Chem.*, 23, 8: 931-936 (Aug.), 1931.

The Health of Office Workers—

This paper was presented by the author before the Office Management Conference of the American Management Association, and considers, in Part I, the health status and needs of office workers in which the matter of the individual is discussed with relation to sex, age, term of service, marital condition, causes of sickness and death, and then with the matter of environment as related to size of community, the effect on health of the number of workers in office or building, the advantages and disadvantages of an office environment, ventilation, heating and lighting, and special working conditions pertaining especially to stenographers, typists, and comptometer operators.

Part II takes up suggestions for dealing with the health problems of office workers, considering the essentials of an industrial health program, the characteristics of the office worker group, importance of personal hygiene, and of pre-employment physical examinations.

Management's opportunities and responsibilities for the health of office workers are outlined under working conditions and environment, periodic health examinations, health supervision, health education, and medical and social service.

Certain relations of the American Telephone and Telegraph Company, of which the author is health director, are made under some of the above headings.

Three pages of discussion follow by T. O. Kennedy of the Ohio Public Service Company, John S. Shaw of the Hercules Powder Company, L. R. Frazier of the Dennison Manufacturing Company, Hanns Gramm of the Textile Machine Works, A. M. Boyd of the Philadelphia Electric Company, S. F. Shattuck of the Kimberly-Clark Corporation, R. O. Beckman of the Kroger Grocery & Baking Company, and by the author himself.—Leverett D. Bristol, American Management Association, Office Management Series: No. 48 (20

Vesey Street, New York, N. Y.), 20 pp., 1930.

Dust Hypersensitiveness with Special Reference to Castor Bean—

In the study of castor bean dust hypersensitiveness there is an especially interesting phase of the dust problem. The correlation with animal experimentation is also singular. A review of literature reports pertaining to this problem is given.

The occurrence of endemic asthma in a community, reported elsewhere, encouraged the author to make experiments, using guinea pigs. The results tend to support the hypothesis that an antigenic dust in a dry state can act as a sensitizing agent, and that entry into the body may be gained through the nasal mucosa. From this it is believed that dusts produced in industries may be significant factors in the production of certain respiratory sensitization afflictions.

Preventive measures, it is hoped, may eventually recognize the problem as stated.—Bret Ratner, *J. Allergy*, 2, 1: 3-7 (Nov.), 1930.

Domestic Carbon Monoxide Poisoning, 1931, Ohio Department of Health—

A summation of the carbon monoxide mishaps associated with gas-fired heating appliances, reported to the Division of Industrial Hygiene for the year July 1, 1930, to June 30, 1931, shows that there has been a considerable reduction in the number of fatalities this year from those of previous years. Last year there were 52 deaths. The average for the last 5 years is 44. This year there are 35 including 3 from unburned gas of which were 9 we have news-9 cases with 3 deaths, not in the above figures.

Space-heaters,

deaths, water heaters with 5, gas ranges with 6, and hot-plates with 3 deaths. Twenty-six cases with 6 deaths occurred in bedrooms, 14 cases with 8 deaths in living rooms, 16 cases with 5 deaths in bathrooms, and 21 cases with 5 deaths in kitchens.

Heaters in bedrooms and water heaters in bathrooms continue to be among the leading offenders.

A faulty water heater in a school basement was the cause of 13 cases, although there were no deaths. There were 3 cases reported due to gasoline water heaters, and 1 to a gasoline clothes press, with no deaths.

Among the general features, domestic users are asked to see that all gas heating appliances are properly ventilated. They should not be located in sleeping rooms. Water heaters should not be located in bedrooms or kitchens. Care should be taken to see that in case of gas ranges, the burners are located at a sufficient distance below the grids to prevent the inner blue cone of the flame from touching cold vessels or objects to be heated up.

There was a considerable increase in the number of deaths from auto exhausts. Out of a total of 98 mishaps there were 41 deaths as compared to 84 mishaps and 35 deaths last year. All the deaths occurred in garages. Five apparently were suicidal.

It is felt that too few auto drivers yet realize the chances they take when exposing themselves to motor exhaust fumes in closed garages.—B. E. Neiswander, Chief, Division of Industrial Hygiene, Ohio Department of Health, Typewritten Report, 5 pp., July, 1931.

Heart Disease and Mental Strain—Observant clinicians have frequently noted the tragic crises in cardiovascular cases, when a man is stricken, not from running for a car or climbing a flight of steps, or horseback riding, or dancing, but from some intensive strain in a di-

rectors' meeting or a business conference, requiring unusual concentration on problems involving great responsibility or intensive intellectual analysis.

Dr. Carey P. McCord at a recent meeting of the Association of Life Insurance Medical Directors presented the results of clinical investigations sponsored by The Heart Council of Cincinnati as to cardiac conditions in various types of employment. He said:

The concept that work is not a producer of heart and blood vessel degeneration is almost entirely linked up with excessive muscular work on a foot-pound basis, such as may arise in the ditch digger, the boiler maker, the football player, or the Olympic runner. It is granted that scant proof exists that such work leads to cardiovascular harm. On the other hand, there are forms of work, as well as other aspects of human life, that lead to continual trauma or indignities to the autonomic nervous system, that so influence the functions of visceral tissues as to culminate in organic changes. It is the thesis of this paper that the cardiovascular system may be organically involved in this process.

Referring to the particularly high rate of cardiovascular disease among train dispatchers, Dr. McCord says:

... We are prompted to believe, from all our findings, that portions of this unusual extent of organic cardiovascular abnormality are the results of prolonged, overwhelming mental strain—in short, *organic impairment from mental trauma*.

While it may be true, in a physical sense, that a healthy heart cannot be strained, we are inclined to believe that this is not the case in so far as the autonomic nervous system is concerned. With blood pressures and pulse rates responding quickly to psychic factors, there exists a situation in which mechanical disturbance can supervene and do actual physical damage.—*How to Live*, 14, 7: 1-2 (July), 1931.

E. R. H.

The Subjective Side of Fatigue in Industry—A large public utility cor-

poration invited the writer to devote a whole year to the observation of a group of normal workers of various occupations, ages, personality types, and nationalities. They were very carefully examined physically and followed through the year both at work and at home in the case of 12 men, while 5 others were studied with the same care for periods of several months, and over 100 workers were included at one time or another in some phase of the fatigue study. It was found that plant factors and non-plant factors could be weighted and compared in causation of fatigue, also that measures for reduction of the plant factors could be reasonably prescribed.

There is still needed the discovery of scientific methods of detecting a harmful amount of fatigue. Usually the feeling of tiredness coincides with true fatigue, though this is not always the case. Boredom and the feeling of tiredness may both be the result of a mental or emotional attitude. To feel tired more than one-fifth of the waking time is suggestive of an unwise environmental strain or of organic malfunctioning. Tiredness should also occur irregularly both during the day and over longer periods.

The outside activities including efforts at recreation, family duties, and sleep habits are the most important causes of fatigue. All told, the employer would seem to be able to reach only half of the causes of fatigue by direct methods, but can lead in attempts to reduce the effect of the non-plant causes. Among these latter causes, the woman is all important; for she, whether wife or sweetheart, is the most powerful stimu-

lus of the outside factors. Therefore, wise education of the women in sane living in the broadest aspects will become the most powerful controlling factor.—Rex B. Hersey, *J. Indust. Hyg.*, XIII, 6: 185–203 (June), 1931.

E. R. H.

Arsenical Poisoning—Several cases of arsenical poisoning of industrial origin are reported: (1) enamelling bathtubs with a glaze composed of arsenic-lead vitreous enamel; (2) enamel fusing of the preceding vitreous enamel for 3 months; (3) brass moldings, mostly scrap metals—slightly affected; and (4) furnace hand, brass molding—slightly affected. In the case of brass molders, old gas fittings were suspected as the source of the arsenic.

The proof of these cases was determined by the examination of the hair and nails. The analysis of the urine in such cases is often of little value. Arsenic in the hair ran from 1 to 8 mg. per 100 gm. Arsenic in the nails was found to the extent of 9.2 mg. per 100 gm. In the case of a sprayer using a solution of sulphuric acid and arsenic for 10 days and developing severe peripheral neuritis, 33.5 mg. of arsenic per 100 gm. were found in the hair, and 160 mg. in the nails, at a time of 79 days following the last exposure.

Arsenic was found in the urine in the first 4 cases above mentioned in amounts ranging from nothing up to 0.16 mg. per l. and at a time following the last exposure from 1 to 60 days.—Charles Badham *et al.* Report of the Director General of Public Health, New South Wales, for the year ending 31 December, 1929.

E. R. H.

CHILD HYGIENE

RICHARD A. BOLT, M. D., DR. P. H.

HEALTH OF THE PRESCHOOL CHILD

THE preschool age can no longer be looked upon as the neglected period of childhood. Since the publication in 1923 of *The Preschool Child*, by Arnold Gesell, and *The Health of the Runabout Child*, by William Palmer Lucas, a tremendous amount of interest has been aroused in the physical, mental, and social development of the child from 2 to 6 years of age. A great deal of valuable data has been assembled from researches carried on in connection with institutes of child welfare. The growth of the nursery school movement in this country also has added to our knowledge of the preschool child. Studies carried on by various committees of the recent White House Conference on Child Health and Protection give us a new basis upon which to proceed in our endeavors for the health of the child before school entrance. It may truly be said that we have accumulated enough knowledge to protect the health of the child of preschool age, if only we could find ways and means of applying it to the individual child.

The importance of the preschool age can scarcely be over emphasized. The first year of life has problems peculiar to itself, which have been attacked vigorously during the past 20 years. That we have met with measurable success is indicated by a cutting of the infant mortality rate practically in half. Present-day problems center about maternity, early infancy, and the preschool years. Aside from the first few months of life, the preschool age is one of relatively low mortality and high morbidity. Considerable damage is done during this

period, the child suffering from many defects which may not become evident until later in life. This is a period of rapid growth and development, which creates problems concerning nutrition, immunity and resistance, posture, etc. Many new environmental adjustments are necessary. It is well known that the child is highly susceptible to the infectious diseases during the preschool years. Our efforts for prevention, therefore, should be centered upon this period. Measles, whooping cough, diphtheria, and scarlet fever take their greatest toll before school entrance. The young child is very susceptible to these and other diseases, which do not necessarily kill the child, but may leave it with serious defects of the eyes, ears, heart, kidneys, or lungs. Crippling during childhood is due largely to injuries at birth, poliomyelitis, tuberculosis, and accidents.

The period under consideration is one in which the child becomes rapidly socialized. In its wider contacts it is exposed to many physical, mental, and moral hazards. This is an age of death dealing and disabling accidents, a considerable number of which are readily preventable. Accidents have assumed greater and greater importance as a cause of death and crippling among children of preschool age. In the earlier years many of them take place in the home environment and in the later years on the streets and public highways.

We recognize definitely now the childhood type of tuberculosis. It results usually from contact with tuberculosis in the home environment. If we could

recognize it early and place the child under proper supervision, we could largely control tuberculosis in children. The problem during school age would not be so serious as it is now. The main factors of tuberculosis in childhood have been discussed in the July issue of this JOURNAL.

Psychiatrists now tell us that the years before school entrance are those in which many habit and behavior difficulties arise. These offer a wide field for proper guidance and mental hygiene. If we could correct the early disorders of personality and the emotional upsets arising in children before school age, it is certain many of the problems of delinquency could be solved more readily. Proper technics in handling behavior problems have been worked out in our child guidance clinics. A considerable mass of valuable material derived from case studies in these clinics is now awaiting application to the preschool child.

It should be borne in mind that the child hygiene movement of the past two decades has made it possible to save more children, who now are living in the preschool and school years. While the birth rate has declined in recent years, it has not affected appreciably the number of children coming into the upper age groups. Our problem for the preschool child, therefore, assumes a quantitative as well as a qualitative aspect.

The program we adopt for the health of the preschool child depends upon its basic needs prior to school entrance. These are plainly evident. The question arises how best the needs may be met through individual or organized health and social work of the community. Modern scientific methods in medicine, education, and social welfare should be made available to every child. These methods include:

1. *The extension of regular systematic health examinations* with which we are so familiar in infant welfare. These should be conducted by a pediatricist or physician skilled in handling

children and interested in preventive medicine. This has been made possible for the infant by means of infant welfare centers as a part of community health centers.

Coöperation with the home is essential. In many places measures have been taken to bring this about through the parent-teacher associations, women's clubs, day nurseries, and kindergartens.

2. *The protection against the communicable diseases by immunization* against those for which we have adequate measures, such as smallpox and diphtheria. Suitable quarantine should be carried out in all cases. Popular education of the parents as to early signs and symptoms of the communicable diseases is desirable, and the social responsibility to keep sick children isolated from other children should be stressed.

3. *The promotion of good nutrition* Malnutrition often begins in this period from bad habits of eating, unwholesome or poorly balanced diets, and over-stimulation. There is no question but that a large amount of malnutrition in early school life has its beginning in the preschool years.

4. *The prevention of heart disease in childhood.* This also is a preschool problem. The control of the acute infectious diseases, chronic tonsillitis, focal infections, and rheumatic fever undoubtedly would do much to reduce the incidence of heart disease. As a matter of fact, there is evidence which leads us to believe that heart disease during the preschool years is decreasing, due to better control of the communicable diseases.

5. *Mouth hygiene should begin early in life.* In the preschool period the jaws and teeth are assuming their permanent form and structure. Aside from prenatal hygiene for the mother, these years afford the best possible time in which to begin oral hygiene. Modern research indicates that adequate diet for the mother during the prenatal period and freedom from infectious diseases condition the developing teeth. Suitable feeding coupled with periodic dental care assures the greatest protection for the newly formed teeth.

6. *The promotion of well tried safety measures for the benefit of children.* Instruction in safety-first should begin early in the child's life and continue up to adult years. Much has been accomplished in some places by proper instruction in the nursery schools and kindergartens. The schools themselves have been a great factor in the safety-first campaign. In some cities the junior safety squad has rendered excellent service in preventing accidents in the neighborhood of the schools.

7. *Mental hygiene and child guidance.* Opportunities should be afforded, through child

guidance clinics, day nurseries, and kindergartens, for the observation and guidance of young children, especially those exhibiting deviation from the normal. This is the period in which social maladjustments begin. It is the ideal stage to inculcate good habits and influence character building. Parents should be given the best possible information and instruction to meet conduct difficulties. Expert diagnostic facilities should be available. A better correlation and extension of all the facilities in the community to meet the mental hygiene needs of the child should be worked out.

With these needs of the preschool child constantly before us and with the scientific methods of approach in our hands, the next step to determine is the availability of community resources. In almost every city one or more of the following facilities already are available and others could be established readily:

1. The medical and dental professions.
2. Local health centers in which work for the preschool child is integrated with other phases of the child health program.
3. Public health nurses and visiting nurse associations.
4. A bureau of child hygiene of the local health department, operating through child welfare centers, children's clinics, and dispensaries.
5. Nursery schools, day nurseries, and kindergartens. The educational facilities of the

kindergartens and of the nursery schools lend themselves very favorably to preschool hygiene.

6. Child guidance clinics.

7. Parent-teacher associations. In many places parent-teacher associations have taken the initiative in securing coöperation between the schools, the medical profession, and the local health department in providing preschool examinations.

8. Municipal and school playgrounds.

9. Parental and pre-parental education.

In most places the main problem seems to be not one of lack of adequate facilities, but of community organization to facilitate a coöperative plan whereby each organization may contribute its special work for the good of the whole. Representative group consideration and decision upon the local problems concerning the preschool child are essential. Minimum standards for the health of the child should be determined, based upon scientific procedures and well tried methods. An attempt should be made to have these essentials carried out through the various local organizations, making use of existing facilities. A careful study and analysis of all data pertaining to the preschool child in each locality should be made, and a comprehensive program laid out to meet the needs.

REPORT OF A PRESCHOOL AND INFANT WELFARE CLINIC

DR. E. V. THIEHOFF, Chief of the Child Hygiene Service of the City Health Department in Akron, O., recently prepared an informative report of the work accomplished at the preschool clinic in that city.

At the beginning of 1929 the City of Akron, O., annexed the suburban town of Kenmore, with an approximate population of 15,000. The Akron City Health Department immediately proceeded to institute a preschool and infant welfare clinic to serve that district. Since that time a 2-hour clinic has been held twice a week. Nursing service is provided

for the clinic by the Division of Public Health Nursing of the City Health Department. There is 1 station nurse with 1 assisting nurse in the clinic. One physician is in charge.

The nurses do the clerical work, taking the case histories, and also weigh and measure the children. The station nurse assists the physician in the examination and attention given the clinical patrons.

Emphasis is laid upon the fact that this is a clinic for well children. Parents are urged to take children who are ill or have physical defects to private physicians or to other agencies. The purpose is to keep the child well. No treating is done in the clinics, but all cases needing medical attention are referred

to the private physicians, or in indigent cases to hospital dispensaries.

Immunization against smallpox and diphtheria is offered to those who cannot or would not go to a private physician. Children are accepted in the clinic up to school age (6 years). . . . When they reach school age they are dismissed and transferred to school records. . . .

The report covers the period from February 28, 1929, to February 28, 1931. Thus we find that after 2 years, 424 out of the 827 children, both infants and preschool children, who have entered the clinic are still active. This is approximately 50 per cent. . . .

The clinic serves a district with a mixed national population with relatively few colored people. In the majority of cases there are only three or four members in the families represented. The largest number of fathers are classed as skilled laborers. Most of these work in the rubber and tire factories. Their average annual income is \$1,500. Due to the current depression there are quite a number who are unemployed and have been for some time. It will be noted that most of the mothers are housewives, but few being employed outside of the home. . . . The large majority of cases have their private physician to whom they go for any medical attention or

service. The name of the family physician in each case is kept on record and if need for medical service arises, the patron is immediately referred to that doctor . . .

Out of a total clinical attendance of 3,655 infants and preschool children for the 2-year period under consideration, there has been an average weekly attendance of 35 plus or approximately 18 children to a clinic. . . .

The number of correction of defects secured as compared to the number found is very small. This is in part due to the fact that many clinical patrons move or become inactive before correction of defects is secured. There are many children who need correction of defects but their parents cannot afford such and charity demands on local hospitals have been so heavy that the hospitals cannot begin to meet all the needs. Undoubtedly this matter of securing correction of defects is a weak factor in the clinic.

The station nurses make home visits not only to urge correction of defects but also to advise the parents as to the care of the children. It will be noted that they have made a large number of such calls, especially when one considers that their work is not confined to the clinic but that they do school and public health nursing service in general.

PUBLIC HEALTH NURSING

EVA F. MACDOUGALL, R. N.*

The Milbank Memorial Fund Aids Nursing Education—All groups interested in the improvement of public health administration are emphasizing the need for better trained personnel. The Milbank Memorial Fund knowing that the rôle of the public health nurse is one of growing importance in both official and unofficial health organizations has for some time been interested in better training for public health nurses. Three public health nursing

projects are at present being assisted by the Fund.

RURAL NURSING SCHOLARSHIPS

Since 1926 the Fund has offered scholarships for rural field experience for students from the Nursing Education Department in Teachers College, Columbia University. The scholarship allowance is large enough to provide transportation and living expenses for 2 months in Cattaraugus County where the health department is organized on a county unit plan, thus enabling the student to have experience as well as ob-

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

servation in a generalized public health nursing program.

By the end of the summer of 1931, 17 nurses will have had this field experience. With one or two exceptions all of the nurses who have completed this course are engaged in public health nursing.

THE TEACHING SERVICE OF EAST HARLEM NURSING AND HEALTH SERVICE

In 1928 the Milbank Memorial Fund made a special grant which initiated the teaching program of the East Harlem Nursing and Health Service because field experience was needed for advanced public health nursing students. Here the teaching staff is of university caliber and maintains high standards and technics.

Three hundred ninety-seven students have been enrolled in this educational service in the last 37 months. They represented 36 states and 30 different countries. Nearly half of the students came from the Department of Nursing Education of Teachers College, Columbia University. Thirty per cent of the enrollment comprised nurses from other health organizations in New York, and 22 per cent registered through an affiliation with the Rockefeller Foundation. Most of these latter were from foreign countries.

In addition to these there were 113 "visitors" who spent an average of between 3 and 4 hours in group classes and individual conferences.

DEPARTMENT OF PUBLIC HEALTH NURSING, SYRACUSE UNIVERSITY

This course was described in these notes in the April, 1931, number of the *American Journal of Public Health*.

There are two programs of study offered properly qualified graduate nurses at this university: one leading to a degree of B.S. with a major in Public Health Nursing; the other leading to the certificate in Public Health Nursing.

Supervised field experience is offered

in addition to the theory, through the coöperation of the Syracuse City Health Department Bureau of Nursing, the Visiting Nurse Association, and the School Health Service of the Board of Education.—From the *News Digest* in the *Milbank Quart. Bull.*, July, 1931, pp. 142–144.

First Aid Instruction for Nurses—Many graduate nurses have found, when faced with the necessity for administering first aid far from the reach of physician and hospital, that the nicely applied spiral reverse bandages at which they were so adept in student training days have little place in the emergencies of motor, camp and industrial accidents. As nurses have entered the broader fields of public service, industrial nursing and health instruction, they have found themselves wholly unprepared to administer or teach anyone else to administer the simple first aid procedures. It has been a large task for the public health nurse to prepare herself so that she might teach first aid to 4-H Clubs and scout groups, which are increasingly demanding such instruction.

An article in the *Red Cross Courier* of July, 1931, with the title "Student Nurses Grounded in First Aid," shows a recognition of the need for more intensive first aid instruction for nurses and relates a practical way of meeting the need:

For the last 4 years the senior classes in every school of nursing in Columbus, O., have been instructed in the Red Cross standard first aid course. Dr. Drew L. Davies, Chairman, First Aid and Life-Saving Committee of Franklin County Chapter, who gives the instruction, points out that the enrollment of these student nurses is one of the most potent influences in the extension of this service. . . . Mr. Davies said:

"From the receiving rooms of many of the Columbus hospitals comes the interesting information that there is a

decided improvement in the condition of accident patients when they are brought in, due to treatment having been rendered by Red Cross first aiders."—*Student Nurses Grounded in First Aid, Red Cross Courier*, XI, 1: 405 (July), 1931.

Medical Social Service Versus Public Health Nursing—The California State Board of Health held one of its examinations for public health nurses in May. One of the girls who received the highest grade in the written examination answered the question as to how medical social service differs from public health nursing as follows:

Medical Social Service

- (1) Determines eligibility for care at public expense.
Cases may be referred to medical social worker from other social service worker or case worker.
- (2) Assists patients to settle economic and family problems in order to enter hospital to receive proper care.
Helps patient in hospital by helping settle family and business affairs.
- (3) Follows cases after patient goes home.
Helps patient make adjustments to his health and limitations. May sometimes locate contacts or sources of infection of disease.

Public Health Nursing

- (1) Refers to clinic or hospital for care at public expense.
Finds cases in field and persuades patient to apply for needed care.
- (2) Almost no work done in hospitals now.
Prevention could be done—child welfare taught in maternity and pediatrics wards.
- (3) Makes home visits and helps patients in health problems. May do much to prevent a relapse and assist in normal recovery. Sees that doctor's orders are being carried out.
May also advise economically and do same type of work done by medical social worker in mental hygiene and general advice.
Watches contacts and helps prevent communicable disease.

—Questions and Answers in Public Health Nurse Examination, *Weekly Bull.*, Calif. State Dept. of Public Health, June 20, 1931.

At Last! Some Research Work in Public Health Nursing—The Board of Directors of the Commonwealth Fund recently made a grant of \$25,000 to the National Organization for Public Health Nursing to finance a study of the present administration and practice of public health nursing.

The N. O. P. H. N. has developed qualitative and quantitative standards in reference to public health nursing, and they have been generally accepted as goals, but it is not known to what extent these standards are in actual operation over the country. An evaluation of the present development of public health nursing as measured by these standards may reveal that some of the standards themselves need revision.

The study will be made in different sections of the country and will cover both rural and urban services under both official and non-official administration.—*Good News, Pub. Health Nurs.*, XXIII, 8: 399 (Aug.), 1931.

The Public Health Nurse and the Partially Seeing Child—Public health nurses, particularly those working in rural districts, have hard problems with the child having eye difficulties. Even after they have succeeded in getting eye defects corrected and eye diseases under treatment, what can be done with the child whose eye troubles are so serious that after everything possible has been done, he cannot see well enough to use the equipment provided?

Oftentimes nurses think this type of child belongs in a school for the blind, when he really belongs with seeing children, because he will naturally use the little sight he has left to learn, instead of switching to the sense of touch entirely.

Teachers of partially seeing pupils in schools for the blind are the first to recognize that in unsupervised periods these children will use their eyes, since sight is their natural mode of approach to the brain, and that the reading of raised dots with the eyes is far more harmful than reading ink print, because there is no contrast to help the eye in distinguishing the letters.

The White House Conference report showed that partially seeing children in 13 states were sent to a school for the blind, and that not rarely these children were placed in classes for the mentally deficient, because here they would receive more attention. State authorities say these children are sent to blind schools because there is no other place for them.

But why not make a place? Twenty-three states have already done so, by establishing sight-saving classes in the public school systems of the leading cities. A public health nurse in any large city can ascertain whether such classes have been established. If she is fortunate enough to be in a city so advanced educationally, her problem of the placement of the partially seeing child has already been solved for her. If there is no such class, her problem should become the problem of the community and perhaps her very effort in relation to this particular charge may be the starting point for giving the educational advantages of a sight-saving class to all in the community who may need them.

What can the small town or rural nurse do for the partially seeing?

1. She may arrange for a child to go to the nearest city in which a sight-saving class has been established.

2. She may interest nurses in other communities to discover these children

in their districts and persuade the education authorities to establish a county class which all these children may attend.

3. If the region is too remote the teacher in the rural school can be given educational media like those provided in sight-saving classes; but this is not a very good solution, as the teacher to be effective should be thoroughly trained in this type of work. However, if given individual help she can do a great deal.

For success in this venture, however, several attributes are necessary: first, a knowledge of the child's eye condition; a progressive myope offers quite a different problem from a child with static low vision. In the former instance it may actually be a matter of saving sight; in the latter, merely a matter of providing the means for an education. The second requisite is a teacher willing to undertake this work and with sufficient intelligence to be able to apply the help given. The third requisite is the necessary equipment.

A knowledge of the eye conditions may be difficult to acquire. It may mean taking the child quite a distance to an oculist for an examination, or it may be that advantage can be taken of a travelling clinic, federal or state. Indeed, such a case may be an entering wedge for the nurse to obtain the advantages of such clinic for her community.

The National Society for the Prevention of Blindness, 450 Seventh Avenue, New York, is always willing to render any assistance it can. Write there for help and information.—Winifred Hathaway, Protecting the Partially Seeing Child, *The Red Cross Courier*, XI, 2: 425, 426 (Aug.), 1931.

EDUCATION AND PUBLICITY

EVART G. ROUTZAHN*

For Readers Outside of North America—Experimentally, a special service is offered to readers in countries outside of North America. Their requests written on letterheads or business cards, accompanied by a money order for the equivalent of 2 cents postage for each request, may be sent to the editor of this department, who will forward the requests to the different publishers or organizations.

A card or letterhead for each separate publication or other sample; on the card the title or description of the item desired; the date of the JOURNAL in which the item was mentioned in this department of the JOURNAL. For periodicals not issued by health organizations and for publications sold at a specific price the order should go direct to the publisher.

"Mr. Average Healthy Citizen"
—Something to read before we make another health talk or write another folder on a health topic: "Science and Health: A Prescription for Cultivating Sales Resistance," by E. P. Lyon, dean of University of Minnesota Medical School. *Survey*, 112 East 19th St., New York. June 1, 1931. 30 cents. What is the "scientific basis" of health; how "health is automatic"; what the individual should know; the "doctrine of chances"; what one need not know; what not to read. "Science is knowledge. Science should make you bold, set you free."

Of course there is much here that you

will reject—but other parts may lead you to check the actual, practical significance of your teaching.

Health Education by a State Medical Society—The Illinois State Medical Society maintains an Educational Committee office at 185 North Wabash Avenue, Chicago. This committee gives a unique service in the field of health education to county medical societies and lay organizations.

Speakers' Bureau: Physicians, members in good standing of the Illinois State Medical Society, are scheduled to present popular health talks before lay groups. The speakers come without any expense to clubs and schools, but the committee does request that at least 3 weeks' notice be given when asking for health programs.

The following list of subjects has been suggested for health talks during the year, September 1931–1932:

Men's Clubs—Financial Values of Health; The Business Man and His Stomach; Disease Prevention and Health Preservation; Physical and Mental Health; Animal Experimentation in Relation to Human Welfare; What Everyone Should Know About Cancer; Health vs. Business Inventories; Physical and Mental Health.

Women's Clubs and Parent-Teacher Associations—Health Problems in Illinois; What Every Woman Should Know About Cancer; Health Inventories; Physical and Mental Health; Our Duty to the Child in Prevention of Communicable Diseases; Preparing the Child for Adolescence; The Parent and Child Relationship; Medical Science

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

Protects the Child; Animal Experimentation in Relation to Human Welfare; Prevention of Disease.

High School Assemblies—Our Debt to Medical Science (story of some famous scientists); Some Important Phases of Health; The Story of Infections; Health Lessons Learned from the World War; X-Ray and Radium: What Every High School Boy and Girl Should Know About Cancer; Health and Happiness.

Radio: Radio talks are given from stations WGN, the Chicago Tribune, every Tuesday morning at 11:50 o'clock, and from WJJD, every Monday, Wednesday and Friday noon at 11:45 o'clock, daylight saving time. The talks cover health subjects of current interest and are a popular feature of the work of the committee.

The Chicago Pediatric Society and the Educational Committee also sponsor a period for young mothers from radio station WJJD at 11:15 o'clock, daylight saving time, every morning. During this 10-minute period, talks of special interest to mothers are broadcast.

Press Service: Press material on health subjects of value to local communities is supplied to newspapers for use over authority of the county medical society or the Educational Committee.

Upon request, special educational articles are prepared on diseases which may be prevalent, or material for diphtheria immunization campaigns, smallpox vaccination campaigns, Summer Round-Up.

General Service: Health poster exhibits loaned to schools and clubs.

The committee does not own moving picture films or projectors, but will secure loan of films and slides from other sources.

Package libraries on health subjects available.

Health folders and literature secured for distribution.

County and city superintendents of schools, women's clubs, men's clubs, parent-teacher associations and all other civic groups are invited to make use of the above services offered by the Educational Committee.

Why One Weekly Bulletin—Detroit issues weekly a bulletin of one or more multigraphed letter-size sheets. It is not popular, but is explanatory and interpretive as to statistics and Department plans and policies. By request Dr. Henry C. Vaughan sent the following:

Our *Weekly Health Review* was designed primarily as an exchange letter between the Detroit Department of Health and the health departments of the neighboring large cities, as well as state health departments. It was created during the time of the influenza epidemic. We found that the statistical information on the prevalence of disease received through the U. S. Public Health Service was too old to be of any particular value to us and we therefore established our own means of keeping informed of epidemic conditions in large neighboring communities and designed our *Weekly Health Review* so that our neighbors might be informed of the situation in Detroit, and likewise so that we might keep the physicians of Detroit informed.

The *Weekly Health Review* is published each week in the *Bulletin* of the Wayne County Medical Society and thus reaches virtually all physicians of Detroit each week. It is also released to the daily papers and is generously drawn upon by these papers as well as the foreign language papers.

Our mailing list grew to the neighborhood of 1,000 but in the interests of rigid economy we have cut this down to approximately 300, which, added to the 1,500 copies sent to physicians through the County Medical Society, makes an issue of 1,800 to 2,000 per week.

A Study of the Market for Health Information—A study was made by the Department of Health, New Haven, Conn., during the summer and autumn of 1930, with the hope that it might add its bit to the present information relative to the worth of booklets and perhaps suggest additional methods of investigation to others.

For this study a health booklet was selected toward which it was possible to take a neutral attitude: "Hitch-Hikers," put out by the Cleanliness Institute, which contains 57 pages of printed material and pictures. The intent of the booklet was to instruct the public in the need of cleanliness in preparation and handling of foods, milk, water, etc. A variety of classes of individuals have been exposed to this booklet and their reactions recorded. Several methods of distribution were used and their effectiveness graded.

The plan followed was divided into two parts. In the first people of different classes, such as householders, motor car drivers, students, library visitors, store customers, bank patrons and policemen, were exposed to a copy of this booklet which contained a brief questionnaire entitled "Help Wanted," and a prepaid addressed return envelope. The responses were classified as to volume and character.

In the second part, not included in this summary, the booklet was presented to groups of medical students, nurses, health workers and high school pupils, without a questionnaire but with the request, and in some instances a demand, that they give their reaction to it.

In part one of the study the questionnaire was so prepared as to present a neutral point of view and so fashioned that answers would be brief. By the questions "Did you pass this copy on to anyone else for their information?" and "If there are any to whom you would like a copy of Hitch-Hikers sent, give their names, etc.," it was hoped to get additional data as to the reader's idea of its value.

A total of 3,475 copies of the booklet were distributed. One thousand were distributed to homes which included those of the rich and poor, the high class residential sections down to the tenement house. Each contained the questionnaire and prepaid return enve-

lope. From this group 30 replies were received.

In parked automobiles in the center of New Haven and also in the outskirts of the city 1,000 were distributed. The booklets were left in unoccupied automobiles, the distributors having been instructed to place them carefully on the seats. These also contained the standard questionnaire and the return envelope. From this group 34 replies were received.

At central points around Yale University campus on the morning of the Yale-Georgia football game 300 copies were distributed. Booklets were left in the Yale Post Office, in the Athletic Association's ticket office, and other places including the Dean's Office, and Divinity School Library. Sixteen replies were received.

In the New Haven Free Public Library 250 copies were placed for distribution. These were arranged on a table in the lobby through which all entering or leaving had to pass. Beside the booklets was placed a sign "Health Bulletins—For Adults Only."

During the period these booklets were on distribution in the Library a special check-up was made from 3 to 4:20 o'clock on one afternoon, which showed that 5.1 per cent of those passing the table took copies of the booklet while 8 per cent looked at but replaced it. Of the 9 who took booklets during this special check only 1 reply was received. Of the number taking booklets during the period the booklets were available in the Library, 41 sent replies.

Two hundred copies were placed in a leading New Haven department store. A small card invited patrons to "Take One." Ten replies were received. Two hundred copies left on the desks and counters of several banks where they could be picked up by patrons brought fourteen replies. From 200 copies distributed to members of the police force 5 replies were received.

One hundred and twenty-five copies were distributed by an usher on the opening night of the season at a large New Haven playhouse. The production was "Mr. Gilhooley." The audience showed reluctance in taking the booklets and of those who did, the larger number left them on the seats when the performance was over. Six, however, were interested sufficiently not only to take the booklet home with them, but to answer by mail. One hundred copies were left on a counter in the Yale Co-operative Shop, frequented largely by Yale students, for free distribution. Three replies were received.

The returns show that the Library visitors took the proposition the most seriously. The per cent of replies was as follows: Library, 16.4; Banks, 7; Yale Campus, 5.3; Y. W. C. A., 5; Department Store, 5; Theatre, 4.8; Automobiles, 3.4; Homes, 3; Yale Co-op Shop, 3; and Police Stations, 2.5.

An analysis of these 164 replies is presented in the following table:

Question	Replies	Per cent of total replies
Did the cover attract your attention, etc.?	yes 144	87.8
	no 11	6.7
	blank 9	5.5
Did you read book from beginning to end?	yes 102	62.2
	no 59	35.9
	blank 9	1.8
Did you read part?	yes 59	35.9
	no 105	64.1
Is the booklet worth reading?	yes 155	94.5
	no 5	3.0
	blank 4	2.4

Additional questions: Has it value in teaching health? Which was most interesting: Picture or text? Did you pass booklet on to another? Requested additional copies for others?

—JOHN L. RICE, Health Officer

How Would You Do It?—There can be little question of the need to know more than we do about the mar-

ket for health advice put up in folders and booklets for free distribution.

Dr. Rice reports on a study carefully planned and carried through with equal care which offers some interesting evidence on the reception given a single pamphlet under varied conditions. What do you think of this study? We should like to use it as clinic material for a discussion in these columns of this important problem of testing the value of educational material.

Do you think 164 replies from a distribution of 3,475 copies is good, fair, or unsatisfactory? Does the comparison between returns from different methods of distribution offer a trustworthy guide to future distributing methods? What do you think of the questions asked of the readers? What other methods of testing interest in health literature do you know about?

POLIOMYELITIS

The following material in the files may be drawn upon another year.

"Blood Wanted to Aid Paralysis Victims," by Thomas Parran, Jr., M.D. New York State Dept. of Health. Aug. 5, 1931. Radio talk. *Free*.

"General Recommendations." New York State Dept. of Health. Press release. Aug. 12, 1931. *Free*.

"Infant Paralysis," by S. W. Wynne, M.D. Dept. of Health, New York, N. Y. Aug. 10, 1931. Radio talk: "there is no epidemic"; reasonable precautions. *Free*.

"Poliomyelitis," by D. C. Steel-smith, M.D. Iowa State Dept. of Health. Press release. *Free*.

"Treatment of Poliomyelitis." *Weekly Bulletin*, Dept. of Health, New York, N. Y.

MAGAZINE ARTICLES

"The Crisis in Medical Service," by R. L. Duffus. *Harper's*. Sept., 1931.

"Feeding the Finicky Child," by H.

L. K. Shaw, M.D. *Herald-Tribune Magazine*, New York. Aug. 16, 1931.

"Getting the Children Ready for School," by Dr. W. R. Ramsay; "The School Lunch," by M. K. Ray. *Farmer's Wife*, St. Paul. Sept., 1931. *Copy free*.

"Vitamin's Place in the Home," by R. E. Wadsworth, M.D. *Collier's*. Aug. 15, 1931. "They have been rebuked—and with good reason."

THEY BELIEVE

In a discussion of "Trends in Nursing Education" (*Am. Journal of Nursing*. May, 1931):

But however nurses may have failed in presenting their needs and problems in alluring and convincing fashion, you will agree, I think, that this business is not entirely up to them. It is the public which is most vitally concerned in this whole question of nursing education and it is the public which suffers most when any system of education fails to function at its best. . . . Somehow the public must be made to face this question and to see that nursing schools need the same kind of public support which is given to normal schools or to agricultural colleges.

NEW

Industrial Health Digest (formerly *The Stethoscope*), Natl. Safety Council, Chicago.

The Commonwealth Bulletin, issued by Minneapolis Health Council, Citizens' Aid Bldg., is now issued jointly with the Minneapolis Division of Public Health.

Bulletin, Massachusetts Soc'ty for Social Hygiene, 1150 Little Bldg., Boston. 4 pages monthly—from March, 1931. Pleasing rough finish paper.

HONORABLE MENTION

To Massachusetts Dept. of Public Health: for dating numerous health education leaflets and folders.

To Trenton, N. J., Bureau of Health; New Brunswick, Canada, Dept. of Health; Hygiene Institute, LaSalle, Ill.: for table of contents in annual reports.

DEPRESSION AND DROUGHT

"A Health Program for Missouri's Drought Area," by Dr. James Stewart. *Missouri Public Health News*, State Board of Health, Aug., 1931.

"If Winter Comes," Community Fund, Minneapolis. 4-page folder on emergency need for visiting nurse and infant welfare services.

DIPHTHERIA

"Stagecoach Days," 4-page folder by Racine, Wis., Health Dept., shows that science "has progressed beyond the stagecoach days" and that diphtheria is now curable and preventable. The cover-page and other silhouette illustrations are by Mrs. Health Officer Bauer.

"Sorry But the Supply Is Exhausted"—That is the reply you may receive if you delay in writing for samples of various pieces of printed matter or other items mentioned on these pages.

Please lay aside some copies of your material mentioned here so that you have them for JOURNAL readers who will write for copies.

Again it should be mentioned that only single sample copies of most publications will be available. So don't ask for *free copies* for distribution except in the case of insurance companies and a very few other publishers. Some of the items listed will be supplied in quantity at reasonable prices.

Again, also, write direct to the publisher, the health department or other address given.

BOOKS AND REPORTS

American Physicians and Surgeons.

A Biographical Directory of Practicing Members of the Medical Profession in the United States and Canada—Edited by James Clark Fiffeld. Minneapolis: Midwest Company, 1931. 1,737 pp. Price, \$30.00.

This ponderous volume of 1,737 pages "is offered as a biographical directory of contemporary members of the medical profession, who are, at the time of going to press, in active practice in the United States and Canada, and who, by reason of their high attainments, skill and reliability, are especially entitled to inclusion in such a book." As far as it goes, the work has been done well, but there are many omissions which detract from its value. The foreword acknowledges that the work does not include all of the best physicians and surgeons in each place and recognizes that there will be criticism of some of the omissions. It states that many excellent members of the profession will not be found listed "because although their skill and reputation are unimpeachable, their duration of practice has not been considered sufficient." These statements do not seem to us to hang together. If the skill and reputation of a man are "unimpeachable," we do not see why length of practice should be considered.

It is manifestly impossible for any one doctor to know the names of all the physicians in the United States and Canada, and to determine their standing, so that a reviewer must select certain places with which he is familiar. Such a study brings to light omissions for which there seems to be no reasonable excuse, especially as the editor claims to have had "traveling repre-

sentatives, especially trained for such work," who "have made personal investigations as to the standing and repute of doctors in each locality," the final decisions being "based on a decided weight of opinion of the doctors themselves." Who these doctors were is not told.

The listing of hospitals is perhaps somewhat more complete, yet even in this we find some curious omissions. For example, in one town which has two hospitals, both of them approved for standardization by the A. C. S., one is mentioned, and the other is not.

The value of a directory depends upon the completeness and the justice with which the selections have been made. As said above, the book will prove of some value as far as it goes, but anyone who expects to find in it a fairly complete guide will be disappointed.

The printing and make-up are excellent.

M. P. RAVENEL

Kompendium der sozialen Hygiene

—By Prof. Dr. B. Chajes. (3d ed. rev.) Leipzig: Fischer's Medizinische Buchhandlung, H. Kornfeld, 1931. 167 pp. Price, bound, M. 11.40.

The progress in social hygiene in Germany, though halted at present by economic conditions, has been such as to command attention throughout the world. This third edition of Dr. Chajes' compendium is a brief but very useful handbook of German practice in the fields of medical statistics, nutrition, clothing, prevention and control of tuberculosis, sexual diseases, alcoholism, child hygiene, industrial hygiene (in-

cluding women's labor, child labor, home work, occupational risks, hours of labor, dust dangers, accident prevention, industrial poisonings and infections), the legal protection of employees (including state supervision, health, accident, invalid, old age, and unemployment insurance), eugenics; and federal, provincial, and community hygienic organizations. CHARLES A. KOFOID

Analogy and Medicine. *A Series of Brief Essays on Popular Medicine—By Louis R. Effler, M.D. Toledo, O.: Published by the author, 1931. 260 pp. Price, \$3.00.*

This little volume is of the same general type as *Three Minute Medicine* by the same author, which we have already reviewed favorably in these columns. It consists of 103 short essays covering a wide range of subjects, all, however, bearing on medicine. If it were possible to summarize these, we should say that they constitute a strong argument against superstition, quackery and cultism and, on the other hand, teach the value of common sense, education, and scientific medicine.

The style is pleasing, and the book is one which can be read at intervals without losing the thread of the argument.

M. P. RAVENEL

Pediatric Education. *Report of the Subcommittee on Medical Education, White House Conference on Child Health and Protection. New York: Century, 1931. 109 pp.*

This is a complete report on pediatric education by the Subcommittee on Medical Education of the White House Conference on Child Health and Protection, of which Dr. Borden S. Veeder of St. Louis is chairman. Statistical studies regarding the physician and pediatrics, undergraduate instruction, postgraduate instruction, and an outline of pediatric courses comprise the first part of the book. The second section is made up

of general discussion and conclusions based upon the statistical studies.

One is impressed at the outset with the enormous amount of work which this report entailed. It covers three main points:

1. A study of the practice of the physician in the field, and his opinion as to the adequacy or inadequacy of his medical school training in pediatrics

2. A study of the position pediatrics occupies in the medical school program, the hours allotted, subjects taught, and facilities available

3. The demands and needs of postgraduate instruction and the opportunities available

The recommendations state that:

1. Pediatrics is a fundamental basic clinical subject and should be recognized as such by medical schools. The department of pediatrics should be independent and of equal academic rank with other departments such as medicine.

2. Adequate teaching staff, hospital and clinic facilities, and laboratories should be provided and adequately financed.

3. The minimum teaching facilities should be:

Fifty beds for infants and children under the control of the head of the department

Ten bassinets for newly-born infants in a maternity hospital or division under the control of the pediatric department

An outpatient clinic with a ratio of at least 10 new pediatric admissions yearly for each student in the senior class

A well baby clinic for teaching normal feeding, growth and development

Affiliation with a hospital for "contagious" diseases

Laboratories for routine and research work

4. Pediatrics should be taught from its broad viewpoint. Particular stress should be laid upon growth and development at all ages, preventive measures, both general and specific, as well as disease in childhood, in order that the physician may be adequately fitted to meet the demands of the modern practice of medicine.

The course of undergraduate instruction should cover the following points:

The physical and mental growth and development of the infant and child and factors influencing same

The nutritional requirements of infancy and childhood including the feeding of normal infants and children

The nutritional diseases of infancy and childhood and their treatment and prevention

The "contagious" diseases: their recognition, prevention and treatment

Diseases and pathological conditions peculiar to early life

The peculiar manifestations of certain diseases in infancy and childhood

Environmental and hygienic factors which are important in early life

Social aspects of pediatrics

Certain special procedures

The importance of specific preventive measures

Certain conditions the immediate recognition of which is essential to saving life

5. Two hundred hours should be the minimum time assigned to pediatrics in the 4-year course. This will afford time for ward and clinic work in addition to standardized courses covering the subject. Electives in addition may be offered.

6. The teaching of pediatrics from a pedagogical standpoint should be carefully studied.

7. Intensive review courses (preferably of four weeks) should be continued for post-graduate students and attendance encouraged.

8. The extension courses at present given in some states should be continued, and started in states where they have not been introduced

The whole report would bear careful study by those who are interested in pediatrics, both preventive and curative.

RICHARD A. BOLT

Scientific Child Feeding in Malnutrition, Underweight, and Anorexia. *New York: Merrell-Soule Division, The Borden Company, 1931.* 48 pp. Free.

This useful pamphlet contains some 70 recipes for child feeding, in each of which the caloric value is increased by from 25 to 75 per cent by the addition of pure powdered whole milk. Full technical data as to the distribution of fat, protein, and carbohydrate, the volume, and the increase in calories are given for each recipe, so that the physician may prescribe those which are suitable for the individual child.

This plan for adding to the nutritive quality of normal recipes without affecting their bulk, flavor, appearance, or consistency, will prove of interest and value to physicians, sanitarians, and

child welfare workers who are concerned with the ubiquitous problem of malnutrition in children. JAMES A. TOBEY

Accidental Injuries. The Medico-Legal Aspects of Workmen's Compensation and Public Liability—By Henry H. Kessler, M.D., F.A.C.S. Philadelphia: Lea and Febiger, 1931. 718 pp. Price, \$10.00.

The intensively busy manufacturing State of New Jersey with its great chemical industries has provided the author a rich field for 11 years' experience as medical director of the state's rehabilitation clinic, the first one in the country, coupled with his former capacity as medical adviser of the compensation bureau.

The present work is based on an experience of more than 63,000 cases personally examined and a close following of foreign experience, especially that described by L. Imbert. It stands unique among American texts and may be expected to fill a decided want for physicians, lawyers, employers, insurance companies and industrial accident boards and commissions for guidance as conceived by an orthopedic surgeon and industrial hygienist who is constantly dealing with the medico legal features of accident and disease. The foreword is by the well known surgeon, Dr. Fred H. Albee, Chairman of the New Jersey Commission on Rehabilitation.

Seven chapters comprise an historical review, the medical aspects of workmen's compensation laws, the basis of scheduling injuries, the general pathology and end-results of trauma, and the criteria of temporary and permanent disability. The next 10 are devoted to trauma of various parts of the body with pertinent anatomico-physiological discussions and evaluations, usually in percentages, of damage and disability suffered. Chapter XVII, on Injury and Disease, deals in a masterly

fashion with this most controversial topic and is followed by a short chapter on Traumatic Neuroses. Disturbance of function is recognized as the key to compensation and attempted rehabilitation.

Hygienists will be particularly interested in Chapter XIX, which devotes 124 pages to occupational diseases, stressing the medico legal aspects of foreign and domestic legislation, with tables of schedules, matters of arbitration, the fixing of responsibility and the evaluation of disability. Some 28 pages, devoted to lead poisoning, present summaries of 213 cases in the author's series and also extensive inclusions from others, much of which is in classified and tabular form. There follow commensurate discussions of the other common industrial poisons, anthrax, radium, the dermatoses and silicosis. The final chapter is devoted to rehabilitation of the physically handicapped.

The work is essentially the author's own. He writes as one thoroughly versed in his subject and widely experienced in practice. Extensive bibliographies are appended throughout for those who would seek further. Numerous fine half-tone figures illumine the text. Tables, court decisions and case citations abound.

Health conservationists will be interested in the author's plea for a public negligence law to provide compensation for non-industrial accidents and other disabilities suffered indirectly as the result of modern congestion, speed of activity, and a chemico-mechanistic existence.

EMERY R. HAYHURST

Resistance to Infectious Diseases—
By Hans Zinsser, M.D. (4th ed.)
New York: Macmillan, 1931. 651 pp. Price, \$7.00.

This 4th edition of the standard text, *Infection and Resistance*, comes to us under a new name, owing to the fact

that the subjects treated are now recognized as being much closer to the interests of physicians occupied with infectious diseases than formerly.

During the 8 years which have passed since the publication of the 3d edition, our knowledge has broadened along many lines involving the biological characteristics, chemistry, and specificity of microorganisms and their products. The fundamental sciences have been called in to solve many problems and great advances have been made. The study of the filtrable viruses has opened an almost entirely new field, necessitating many changes in the text, which has been brought up-to-date as nearly as is possible. There has also been some change in the order of treatment, and some chapters have been practically rewritten. Disproved and outworn theories have been omitted, as well as technical details of diagnostic reactions and experimental methods.

This work has been a standard guide for some 17 years. In its present form it will doubtless retain the high place it has held in the opinion of bacteriologists and those working along the various lines of which it treats. Abundant and well selected references are placed at the bottom of the pages. A good index adds to the value of the work. The printing and make-up are excellent.

M. P. RAVENEL

International Health Year-Book, 1929 (Fifth Year). *Reports (with Vital and Public Health Statistics) on the Public Health Progress of Forty Countries and Colonies, in 1928.* Series of League of Nations Publications, III. Health, 1930, III, 8. American agent, the World Peace Foundation, 40 Mt. Vernon Street, Boston, Mass. Price, cloth, \$8.00.

This is a volume of 1,504 pages, which gives the progress in health matters in 40 countries and colonies throughout the world. It contains

many tables giving vital and health statistics. Important changes in health organization in the various countries are noted, and measures of defense against epidemics of all sorts described, including social hygiene. A section of 54 pages describes industrial hygiene in Belgium, Germany, Great Britain, Italy and The Netherlands. Short sections are devoted to the League of Red Cross Societies, the Rockefeller Foundation and the Health Organization of the League of Nations.

The section on Public Health Work in the United States deals largely with the activities of the U. S. Public Health Service, since no effort has been made to treat of the work in the various states individually.

The book is well printed and apparently accurate. It is a mine of information. The only drawback is that the data are for 1929, and give a description of the work done in 1928. Such delay is unfortunate but probably unavoidable.

M. P. RAVENEL

Biology in Human Affairs—Edited by Edward M. East. New York: McGraw-Hill, 1931. 410 pp. Price, \$3.50.

This book, according to Professor East, is offered "as a contribution toward the better understanding of the ideals, the methods, and results of biology." The term "better understanding" is significant as it presupposes that the reader will approach the material with a substantial background of scientific information. In other words the book is for the serious perusal of those with already well informed minds. In fact, the student of biology can find very stimulating reading within its covers.

Professor East begins the discussions with "Biology and Human Problems." He is followed by Frank M. Hankins with "The Prospects of the Social Sciences." These two chapters furnish a

general survey of the present aims of biology and its possible future extension into problems once considered outside of its field. The second part of the book is devoted to affairs of the mind under "The Renaissance of Psychology," by Joseph Jastrow; "Educational Psychology," by Lewis M. Terman; and "Psychology in Industry," by Walter V. Bingham. The third part takes up the body with "Heredity," by Professor East; "The Frontiers of Medicine," by Morris Fishbein; "The Outlook of Public Health Work," by Hugh S. Cumming and Arthur M. Stimson; "Physiology of Today," by E. Kennerly Marshall, Jr.; and "Zoölogy and Human Welfare," by Howard M. Parshley. The book is completed with two chapters on food—"Efforts to Increase the Food Resources," by Donald M. Jones; and "Diet and Nutrition," by E. V. McCollum.

Today, with man's environment changing so swiftly as to leave him confused in his readjustments, such a book, bringing together, as it does, authoritative, readable scientific analyses of advances in allied sciences, will be welcomed as a valuable guide to straight thinking.

LENNA L. MEANES

The Infant Welfare Movement in the Eighteenth Century—By Ernest Caulfield, M.S., M.D. New York: Hoeber. 203 pp. Price, \$2.00.

This is an interesting account of the early efforts for child welfare as carried out by a number of leaders of medical thought in the 18th century. The greater part of the book is taken up with a description of the progress of infant welfare in London. It contains an excellent review of Thomas Coram's work in establishing and continuing the Foundling Hospital in London. A chapter each is given to William Cadogan, Jonas Hanway, and George Armstrong. Many interesting sidelights on the lives of these men and their

particular contributions to infant welfare are revealed. Dr. Caulfield has given us a very readable story of the lives of those pioneers in pediatrics who were interested in the early infant welfare movement. Excellent portraits are presented of each of the men whose work is described. A list of references and convenient index of subjects and personal names complete the volume.

RICHARD A. BOLT

Berufskrankheiten. Ihre Ursache und Vorbeugung. Bibliothek für Gesundheitspflege und Arbeiterschutz der Vereinigten Staaten von Amerika—By Dr. B. Liber. Heft 4. Brooklyn: Published by the Workmen's Sick and Death Benefit Fund of the United States of America, 1930. 37 pp. Price, \$15.

This booklet contains a brief review of the occupational hazards to the health of workers, with a summary of the clinical symptoms, of the actions of the various industrial agents contributing, a list of the fields and occupations which present them, and the hygienic and sanitary measures available to the worker for their reduction or elimination.

Among the forms of industrial poisonings discussed are those by arsenic, steel, chromium, lead, and mercury. The effect of industrial dusts upon skin, eyes, digestive system, and lungs is reviewed, and there is also an analysis of the relation of tuberculosis to the various fields of industry contributory to this white plague. Silicosis plays a noticeable part in creating favorable conditions for pulmonary tuberculosis.

Diseases of the nervous system are discussed, with charges against the program of the efficiency expert and the monotony of mechanized industry as contributing to this group of functional disorders. In a secondary way these same factors contribute to the cumulative effects of fatigue upon workers and

the premature and permanent exhaustion of the worker.

One section is devoted to the symptomatology of health deficiencies and the significance in men and women of such factors as pains in different parts of the body, flat feet, constipation, exercise, and food, especially fruit, vegetables, and alcohol. A list of industrial occupations and the hazards inhering in each closes the booklet. It is of especial interest, as it emanates from the employees' side of this ever enlarging field of public health, rather than that of the investigator, physician, or scientific expert.

C. A. KOFOD

Health Stories and Practice—By William E. Burkard, Ph.D., Raymond L. Chambers, Ph.D., and Frederick W. Maroney, M.D. Illustrated by Vera Stone Norman. Chicago: Lyons and Carnahan, 1931. 256 pp. Price, \$.76.

This is a supplementary reader for third grade written to inspire pupils of this reading level to include certain fundamental health practices in their daily routine. The stories are entertaining. Some of them are based on the experiences of real as well as imaginary characters. Children still enjoy reading about fairies, gnomes and brownies. However, in this sophisticated time when they make the acquaintance of radio entertainers of their own age, they have little faith in stories about fairies who do or do not observe the health rules set down for boys and girls. The new school of health education emphasizes realism.

There seems to be an inconsistency in the general plan of the book. In the presentation of certain health habits the whys and wherefores are given, whereas this factual teaching is omitted in other stories.

The colorful illustrations add to the attractive make-up of the book.

ANNA B. TOWSE

Farm Children—By *Bird T. Baldwin, Eva Abigail Fillmore and Lora Hadley*. New York: Appleton, 1930. 337 pp. Price, \$4.00.

There are various indications that the rural child is beginning to get some of the attention he deserves: one of these indications is *Farm Children* and the research upon which it is based.

The purpose of the study was "to determine the factors that influence the physical, mental, educational and social development of farm children in certain localities." Many of us would agree, however, that in most particulars similar observations could be made, by those acute enough to do so, in the great majority of rural communities of this country.

The book starts off with a description of the physical characteristics and historical background of the two communities "Homeland" and "Cedar Creek" which were the subjects of the study. The environment, religion, recreation, and education of the farm children living in these communities are gone into thoroughly. The chapter on Social and Economic Factors in Farm Life is of especial interest in view of the discussion now rife concerning the future of the agriculturist in an industrial civilization. Very timely too is the light thrown on the controversy over the "One Room School" versus the "Consolidated School."

An appealing chapter is the one devoted to characteristics of farm children and another to activities of children in these contrasted communities. Certain detailed case histories add piquancy to the discussion. The ideals of one community apparently were those most likely to fit in with a "business civilization"; while the other community on the whole did not have its attention so firmly centered on the main chance. A chapter that should be read by all interested in rural life—or urban life either, for that matter—is the one on

Advantages and Disadvantages of Farm Life.

Most of the latter half of the book is devoted to an analysis of the physical and mental development of farm children. Detailed tables are shown of the results of physical and mental tests applied to these two communities. Some attempt is made to contrast these results with those of similar urban studies. In the physical examination tables one is rather appalled to find seven varieties of tonsils classified. The number of children included in these tests is small, precluding the possibility of drawing many precise conclusions; it is to be hoped that these data will soon be swelled by others of the same kind.

Careful and unprejudiced studies such as the one under consideration ought to be of the greatest value in giving an adequate perspective to those responsible for the spending of money for the promotion of rural hygiene. Urban experience is not a sufficient background. State and national health workers, for example, who have never had the chastening experience of work in rural communities, are apt to offer quaint panaceas for rural ills. To these in particular, and to all who are interested in rural life in general, this volume by Baldwin and his coworkers may be recommended.

MERRILL CHAMPION

My Health Habits—By *Charlotte Townsend Whitcomb, John H. Beveridge and Evelyn Estelle Townsend*. Illustrated by *Ruth Caroline Eger*. New York: Rand McNally, 1929. Book I, 149 pp.; Book II, 200 pp.; Book III, 238 pp. Prices, \$.80, \$.88, and \$.96.

These health readers follow a course of study in health education for the elementary grades, written by Miss Whitcomb and Mr. Beveridge, which has been very helpful to the teacher or director of health education planning such

a course for the curriculum. Now the authors in collaboration with Miss Townsend have prepared health stories for the first 3 grades, which present health facts in an interesting and readable style for primary pupils. The third book is the most pleasing. The animation and personification of eggs, a bottle of milk and a jar of butter is a hackneyed way of teaching health facts. Another criticism is that occasionally a story is preachy or the story children are too good and too ideal to be accepted by boys and girls with human frailties.

The appendix of health facts and the lesson plans included in Book III suggest many new ideas to the teacher. Miss Eger, who illustrated this series, has caught the spirit of the stories and her illustrations will appeal to children of the primary grades.

ANNA B. TOWSE

Health and Social Evolution—By Sir George Newman, K.C.B., M.D., Hon. D.C.L., LL.D. London: *George Allen & Unwin, Ltd. (Museum Street)*, 1930. Price 4 s. 6 d. net.

This book is made up of the Halley Stewart lectures for 1930. The Halley Stewart Trust, founded in December, 1924, has for its objects, among other things:

1. To assist in the discovery of the best means by which "the mind of Christ" may be applied to extending the Kingdom of God by the prevention and removal of human misery
2. To assist in the study of our Lord's life and teaching in their explicit and implicit application to the social relationships of man
3. To express the mind of Christ in the realization of the Kingdom of God upon earth and in a national and world-wide brotherhood

The trustees have given a wise and liberal interpretation to the will of the founder, one of the series so far having been devoted to Science and Human Progress, and the present one to the effect of health on social evolution.

Sir George Newman has few if any competitors today in his knowledge of public health and his facility in writing interestingly upon it. In these lectures he is at his best. They contain much history concerning the evolution of the public health movement in England, going back to the Middle Ages.

He quotes President Masaryk as having said, in 1918, "National humanitarianism forms the true basis of a successful practical policy," and calls our present methods "Modern Collective Humanism at Work."

He discusses in a most interesting way the gains and losses due to our present methods, and while recognizing that we are saving the lives of a number of infants (some 40,000 per year in England) who belong to a group of former contributors to the high infant mortality rate, and among whom there are almost certainly some "unfit," since the birth rate among the feckless seems to be higher than among the best stock, insists that these children shall be saved, and that England and the world in general will profit by the saving. He holds that with our present knowledge we have no means of controlling either the marriage rate or the birth rate among those considered "unfit."

We would like to quote at greater length from this delightful and informing book, but it must be read in its entirety to be appreciated. All those who are acquainted with the author will welcome his latest effort.

M. P. RAVENEL

HEALTH DEPARTMENT AND OTHER REPORTS

IRA V. HISCOCK

St. Louis, Mo.—The 62d report of the division of health of the department of public welfare includes among its photographs a group of 2-year old children and their mothers attending the child welfare conference in one of the 12 municipal health centers. An organization chart of the health division, with several vital statistics charts, graphs, and photographs of clinic and nursing activities also add interest to this report.

Infant mortality has declined 50 per cent in 20 years to a rate of 57.2 in 1929. An adjusted general death rate of 12.8 was recorded for the year. Of the total births in 1929, 86 per cent were attended by a physician, while 54 per cent occurred in hospitals. In 1926, the division began compiling monthly statistical data concerning births and deaths by 26 health districts, and a map of these districts, with the rates, is reproduced to show the value of such compilations for administrative purposes.

The nursing personnel of the division consisted of 77 graduate nurses, 8 of whom are paid for by the St. Louis Tuberculosis and Health Society. This section has increased its scope of work through an increase in the number of clinics and conferences, which has reduced the time for home visiting somewhat, although 74,373 such visits were made last year, of which 28,386 were in behalf of tuberculosis cases, 12,862 for acute communicable diseases, and the remainder for prenatal and child welfare cases.

An increase in the volume of work carried on in the various sections of the division was accompanied by an increase in bacteriological laboratory ex-

aminations which numbered 79,903, of which 22,549 were made for practicing physicians who use this service to an increasing extent each year. There were 28,082 diphtheria cultures and 25,812 specimens for syphilis and 8,699 gonorrhea smears examined during the fiscal year.

Since the adoption of a sanitary standard for swimming pool water, associated with more frequent inspections and analyses, adopted in 1928, a marked improvement is reported in the sanitary condition of pools.

An outstanding accomplishment of the year was the enforcement of a provision of the milk ordinance requiring a physical examination and tuberculin testing of all cows from which milk is sold in the city. The policy of including in an annual report of this character recommendations for future development of health services, adopted in this report, is commendable.

Buffalo, N. Y.—Expansion of child hygiene activities during 1930 included the adoption of the child health station district plan of regularly examining groups of preschool children in different sections of the city, giving audiometer tests to school children, and extension of tuberculin tests of high school pupils with X-ray examinations of cases showing positive reactions. During the summer, 3,144 children were examined for admission to summer camps. Infant welfare clinic attendance numbered 40,961 visits, including those of 4,102 new and reopened cases. There were 301 active boarding homes for children under supervision.

Immunization procedures included 17,679 smallpox vaccinations in schools

and 2,609 by private physicians and institutions, 13,851 children with diphtheria inoculations completed in schools, and 2,221 in well baby clinics and by private physicians. Of the 16,072 children thus protected, 4,819 were under 6 years of age. Besides the physical examination of school children, 68 men and 269 women applicants for teaching were examined, while 6,647 physical examinations were given to applicants for working permits.

During 1930, a regulation was adopted by the Board of Health whereby inspection of meat animals was augmented by the designation of three places, to one of which carcasses of animals slaughtered outside the city shall be brought for examination and stamping at a specified time. Inspectors assigned to other lines of food inspection were detailed to this service, which has proved valuable. In restaurants and soda fountains, emphasis was given to the sterilization of eating and drinking utensils. Efforts of the smoke abatement division resulted in the installation of an unusual number of mechanical combustion devices.

Imperial County, Calif.—In the first annual report of the Imperial County Health Department (inaugurated as a full-time health unit July 1, 1930), one reads that for the first time in the history of the county, all pupils in the rural schools were given a complete physical examination, while diphtheria immunization was offered to all children up to 12 years of age. General death rates in the county have been lower than those for the state and U. S. Registration Area during the past 4 years, being 10.7 in 1928 and 11.6 in 1929.

In a sense, we have been pioneering in public health. We have tried to build for the future, realizing the importance of a permanent and constructive public health program to the greater Imperial County that is to come with

the completion of the Boulder Dam and the All American Canal project.

According to the U. S. Bureau of the Census, there are 30,698 native whites, 2,438 foreign born whites, 1,954 negroes, and 25,813 of other races in the county. The health department personnel consists of a medical health officer, a public health nurse, and a sanitary inspector, all full-time, with a clerk, state public health nurse, and a market milk inspector on a part-time basis.

The mimeographed report has been carefully prepared, and contains a summary letter of transmission to the Board of Supervisors from the health officer, a table of contents, a descriptive map of the county, besides interesting tables and graphs, and an historical sketch which indicates that two physicians played an important part in the development of Imperial Valley. This report contains data which "make it hard to realize that only 30 years ago a sun parched desert existed where today an inland empire rival to the Nile has become one of the most prosperous agricultural districts in the world." The county covers an area of approximately 4,200 square miles.

During the year there were 76 cases of diphtheria reported, many of a virulent type, with several cases among adults. In the rural schools, 1,575 complete immunizations with toxoid were given by the health department. Previous to these administrations, parents were advised through the mediums of the radio, the press, the weekly news letter, and talks to organizations and clubs to have their children protected by their family physician. In the city of El Centro, 475 complete immunizations were also given through the cooperation of physicians, the Chamber of Commerce and civic clubs.

It has been the aim of the health department to present to the citizens the greatest possible amount of scientific

health information in an understandable fashion. The health officer gave radio talks each Sunday night, issued a weekly health news letter to leading citizens, officials, and organizations, distributed over 500 circular letters and reports on such subjects as sanitation of school buildings, abatement of nuisances, defects among school children, plans for financing a school nursing program, and reporting of communicable disease. Newspaper articles on health subjects appeared frequently, a health department exhibit was prepared for the county fair, while hundreds of pamphlets dealing with health topics were distributed throughout the year.

Attleboro, Mass.—Reduction in deaths and lessened incidence of the common communicable diseases are noted in the 1930 health department report.

The teaching of public health becomes each year an increasingly necessary duty for health departments. . . . The most effective means of health educational work, and the only practical

way in many instances, is by means of direct communication with families in their homes. The positive results obtained by the department nurse through home visitation and the teaching of disease prevention, have made it appear advisable to employ other nurses on a part-time basis in our diphtheria prevention work. The end results of this house-to-house instruction have proved it to be of undoubted value as an educational procedure.

A chronic disease survey of the city was made by the State Department of Health. For individuals over age 40, there were, per 1,000 individuals, 2.3 with cancer in the city as compared with 4.7 in rural Attleboro. The morbidity rate for heart disease in the city was 42.6 as compared with 87.6 in the rural area; for rheumatism, the rate was 72.8 in the city as compared with 126.9 in the rural area. Other interesting data from the survey are reported.

After 8 years of effort in the prevention of diphtheria, during which time the department has given a complete series of inoculations to 3,500 children, a noticeable improvement is reported. No cases have yet occurred among the immunized children.

BOOKS RECEIVED

HUMAN HEREDITY. By Erwin Baur, Eugen Fischer and Fritz Lenz. New York: Macmillan, 1931. 734 pp. Price, \$8.00.

MEDICAL JURISPRUDENCE. By Carl Scheffel. Philadelphia: Blakiston, 1931. 313 pp. Price, \$2.50.

A SCHOOL HEALTH PROGRAM. A Guide for the Teaching of Health. By Belle Louise Barnstead. Ann Arbor: Wahr, 1931. 71 pp. Price, \$.50.

HOW TO INTERVIEW. By Walter Van Dyke Bingham and Bruce Victor Moore. New York: Harper, 1931. 320 pp. Price, \$4.00.

THE HISTORY OF MEDICINE. A Short Synopsis. By Bernard Dawson. London: Lewis, 1931. 160 pp. Price, \$2.50.

THE YOUNG DOCTOR THINKS OUT LOUD. By Julian P. Price. New York: Appleton, 1931. 187 pp. Price, \$1.50.

WHAT THE PUBLIC SHOULD KNOW ABOUT CHILDBIRTH. By Walter B. Gossett. Minneapolis: Midwest Company, 1931. 290 pp. Price, \$2.00.

NEW AND NONOFFICIAL REMEDIES, 1931. Chicago: American Medical Association, 1931. 481 pp. Price, \$1.50.

THE ART OF LEARNING. By Walter B. Pitkin. New York: McGraw-Hill, 1931. 409 pp. Price, \$2.50.

OCCUPATIONAL DISEASES. By Rosamond W. Goldberg. New York: Columbia University Press, 1931. 280 pp. Price, \$4.50.

LABOR AGREEMENTS IN COAL MINES. By Louis Bloch. New York: Russell Sage, 1931. 513 pp. Price, \$2.00.

TUMBLING ILLUSTRATED. By L. L. McClow. New York: Barnes, 1931. 212 pp.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

RAYMOND S. PATTERSON, PH. D.

Influenza Incidence by Age and Sex—Influenza epidemics of 1918–1919 and 1928–1929 are studied statistically, revealing several unexplained differences in age and sex incidences.

COLLINS, S. D. Age and Sex Incidence of Influenza and Pneumonia Morbidity and Mortality in the Epidemic of 1928–1929 with Comparative Data for the Epidemic of 1918–1919. *Pub. Health Rep.*, 46, 33: 1909 (Aug. 14), 1931.

Bottled Water—Closer coöperation between state and federal officials having to do with sanitary supervision of bottled waters is urged.

FRISBIE, W. S. Coördination in the Sanitary Control of Bottled Mineral Waters. *Pub. Health Rep.*, 46, 32: 1873 (Aug. 7), 1931.

Diphtheria Prevention in Detroit—A convincing story of the procedure by which the Detroit Health Department succeeded in getting three-quarters of the city's children immunized against diphtheria. Public clinics were abolished and the children were sent to the physicians of the city. Believe it or not, it can be done.

GEIB, L. O., and VAUGHAN, H. F. The Physician as Health Worker. *J. A. M. A.*, 97, 6: 366 (Aug. 8), 1931.

Postpartum Care—An inclusive summary of the subject covering the lying-in, recuperative, and postpuerperal periods.

GREENHILL, J. P. The Essentials of Postpartum Care. *New Eng. J. Med.*, 205, 6: 274 (Aug. 6), 1931.

Antirachitic Milk—Cows fed a ration including irradiated yeast or viosterol produced milk of high antirachitic

potency. The yeast produced better results than the viosterol. Soon we shall be regaled with yeast-fed instead of contented cows.

HESS, A. F., *et al.* Antirachitic Potency of the Milk of Cows Fed Irradiated Yeast or Ergosterol. *J. A. M. A.*, 97, 6: 370 (Aug. 8), 1931.

Qualifications for Industrial Medicine—What the industrial physician should know about ventilation, illumination, poisons, sanitation and vital statistics is briefly recounted.

LANZA, A. J. The Doctor and the Factory. *J. A. M. A.*, 97, 8: 509 (Aug. 22), 1931.

Keeping up with Public Health—Books and periodicals which should be in every health department library are listed as a part of this discussion of the need of continued study by health workers.

LEATHERS, W. W. The Need for Continued Study in Public Health Work. *Pub. Health Rep.*, 46, 30: 1727 (July 24), 1931.

Fish Tapeworm in North America—Fish taken from four lakes in Minnesota were found infected with the fish tapeworm.

MAGATH, T. B., and ESSEX, H. E. Concerning the Distribution of *Diphyllbothrium Latum* in North America. *J. Prev. Med.*, 5, 4: 227 (July), 1931.

Botulism—How California has proceeded to protect the consumer from botulism caused by infected commercially canned foods. It is suggested that other states should take similar steps to protect the industry as well as the consumer.

MEYER, K. F. The Protective Measures of

the State of California Against Botulism. *J. Prev. Med.*, 5, 4: 261 (July), 1931.

Preventing Foot Ringworm—A successful demonstration of the prevention of the spread of ringworm of the feet by means of foot baths containing 1 per cent sodium hypochlorite.

OSBORNE, E. D., and HITCHCOCK, B. S. The Prophylaxis of Ringworm of the Feet. *J. A. M. A.*, 97, 7: 453 (Aug. 15), 1931.

Sanitarium or Home Care?—Tuberculosis patients are best cared for in institutions, in most instances at a distance from home despite all that has been said in favor of home treatment: this is the burden of this stimulating argument.

RINGER, P. H. Pulmonary Tuberculosis. *J. A. M. A.*, 97, 6: 381 (Aug. 8), 1931.

Research in the Degenerative Diseases—Can industrial health services be utilized to study the underlying causes and the early signs of the degenerative diseases? This paper makes such a proposal.

SQUIER, T. L. An Approach to the Study of Degenerative Diseases. *J. A. M. A.*, 97, 7: 445 (Aug. 15), 1931.

Venereal Disease Prevention—British opinion of the essentials for ef-

fective venereal disease control differs little, if at all, from that prevailing here. Better educational measures, treatment facilities, hospital accommodations, social service are needed there as here.

ROSS, A. O. Venereal Diseases and the General Community. *Pub. Health*, 44, 11: 352 (Aug.), 1931.

British Public Health—The President of the British Medical Association addresses that body on the present state of public health administration in Great Britain, ending with a prophecy of the future. The result is a summary of great interest to American sanitarians, as is the fact that a health officer should be chosen the leader of the medical association.

WILLOUGHBY, W. G. Public Health Today and Tomorrow. *Brit. M. J.* No. 3681, 131 (July 25), 1931.

School Children's Sickness Rates—Sickness studies of New Haven school children revealed the commonest causes to be colds, diseases of throat and tonsils, mumps and measles; half the total were cases of respiratory diseases. Sex influence on the case rates was included in the research.

WILSON, C. C., *et al.* A Study of Illness Among Grade School Children. *Pub. Health Rep.*, 46, 31: 1801 (July 31), 1931.

NEWS FROM THE FIELD

NATIONAL SAFETY CONGRESS

THE accident problem is a universal one and all persons engaged in public health work have a direct interest in promoting the development and progress of the safety movement. Special attention is called, therefore, to the Twentieth Annual Safety Congress and Exposition, which will take place during the week of October 12-16, inclusive, in Chicago. There will be 127 sessions including features and exhibits of safety equipment of particular interest at this time when health safeguards are more important than ever.

Some of the papers to be presented are: "The Evolution of Resuscitation" by Dr. Hart E. Fisher; "Industrial Hygiene in Relation to Safety" by Dr. Thomas H. Parran, New York State Health Commissioner, Fellow A. P. H. A.; "What Modern Chemistry Is Doing for Civilization" by Dr. Charles M. Stine; "A Logical Classification of Accidents" by Dr. H. B. Logie; "Cleaning in the Metal Industry" by Dr. Leonard Greenburg, Fellow A. P. H. A.

IODINE IN MILK

DR. L. J. AUERBACHER, vice president of the Dryco Milk Company, which is a subsidiary of the Borden Milk Company, is establishing an experimental factory in Newberry, S. C.

Experiments at the laboratory of the Food Research Commission of South Carolina have shown that the milk in that state, as well as the grass and vegetables, contains an unusually high amount of iodine. It is proposed to collect milk from the various sections of the state, dry it, and have the samples analyzed at the Dryco Laboratory in

Bainbridge, N. Y., as well as at the Food Research Laboratories in Charleston, S. C.

Supplies will be furnished to Dr. William Weston, Chairman of the South Carolina State Commission, for distribution to a group of hospitals in the middle west and on the Pacific coast, in which they will be used in feeding children and pregnant women, under scientific control. The hospitals have been selected on account of the ability of the pediatricians and obstetricians on duty, and also because of the high incidence of goiter in the localities in which they are situated.

The experiment is expected to extend over a period of 2 years. The object is to determine whether the children of mothers who are fed on milk containing a large amount of iodine are less liable to goiter than their forebears.

"DISEASED" BUILDINGS

IN the field of mental hygiene it has been necessary to explain to the uninitiated the difference between "mental defect" and "mental disease." But we too have been careless with our psychiatric vocabulary. Why the "Psychopathic Ho-pital"? There may be "psychopathic social workers" but state hospitals and mental hygiene clinics try as far as possible to employ safe and sane "psychiatric" social workers. Facetiously, and for the sake of brevity, professional workers have referred to students of mental deficiency as the "feeble-minded group."

"Insane" is a good old fashioned word, try as we might to discard it as a medical term, but why announce, as does a current bulletin, that the founda-

tions have been completed for two "disturbed buildings" and two "epileptic buildings" for the ——— "insane hospital"? Have you ever seen a "nervous hospital"? But even the purist is stumped at "mental institutions," the phrase has come into such general use. The technologist has given us the *televox*, the *electric man* and the robot, but it takes a psychiatrist to endow a hospital for the insane with mind.—Natl. Comm. for Mental Hygiene, New York, N. Y. *News Release*.

PERSONALS

I. RUSSELL RIKER, Member A. P. H. A., formerly Senior Sanitary Engineer of the New Jersey State Department of Health, recently resigned after 16 years' service and is now connected with the Borough of Princeton, N. J., as personal representative and Resident Engineer on their new sewage project consisting of 13 miles of trunk sewer and a new two million gallons sewage treatment plant.

DR. CHARLES J. SCAVARDA has been appointed Health Officer of Flint, Mich.

CLIFFORD CHARLOCK, F.A.P.H.A., after 36 years' service as Health Officer of the Island of Hawaii, retired on June 30. The Board of Health at its meeting on June 17 passed a resolution reading in part as follows:

BE IT RESOLVED: That the Board of Health does hereby express its recognition and appreciation of Clifford Charlock's loyal service to this Board and the community, and does extend to him its wishes for many years of happiness and contentment upon his retirement.

JOSEPH S. CACERAS, Member A. P. H. A., succeeds Mr. Charlock.

JOSEPH P. KANE, M.D., has recently accepted a position as Director of

County Health Work with the New Mexico Bureau of Public Health. Through special funds provided by the Commonwealth Fund organizing county health work in that state, this is being undertaken. Dr. Kane has had experience as a full-time health officer both in urban and rural districts. For some time Dr. Kane was associated with the Gorgas Memorial Institute and for the past two years was a member of the field staff of the Committee on Administrative Practice of the American Public Health Association, serving as Health Consultant for the Inter-Chamber Health Conservation Contest.

JACOB C. GEIGER, M.D., has been appointed by Mayor Rossi as Health Officer for the City and County of San Francisco, Calif., to succeed the late Dr. William C. Hassler.

CONFERENCES

October 5-9, Ohio Welfare Conference. Akron, O.

October 12-16, Twentieth Annual Safety Congress, Chicago, Ill.

October 16-17, Fall Meeting, New York State Sewage Works Association, Ithaca, N. Y.

October 19, 20, Conference of the Child Study Association, New York, N. Y.

October 19-21, Fourteenth Annual Meeting, The American Dietetic Association, Cincinnati, O.

October 22, 23, Seventh Annual Meeting of the Missouri Water and Sewerage Conference, Jefferson City, Mo.

November 9-14, the Ninth Texas Sanitarians' Short School, Houston, Tex.

July, 1932, The Second International Conference of Social Work, Frankfurt, Germany.

September 6-9, 1932, Annual Meeting of the International Union Against Tuberculosis, The Hague, Holland.

American Journal of Public Health

and THE NATION'S HEALTH Vol. XIII No. 11

Volume XXI

November, 1931

Number 11

Presidential Address*

HUGH S. CUMMING, M. D., F. A. P. H. A.

Surgeon General, U. S. Public Health Service, Washington, D. C.

ON behalf of my fellow members of the American Public Health Association it gives me pleasure to express our very sincere appreciation of the opportunity which has been given us to meet in this city which nature and man have combined to make beautiful—a city which, for every educated person, has written upon each page of its history, covering nearly 300 years, romance and tragedy, as well as glorious achievements, both by the early French settlers and their religious leaders and by the British who followed.

We are particularly appreciative of the honor of having your welcome extended by such distinguished representatives of the Dominion, Province, Municipality, and Church.

Those of us who belong to medicine and its allied branches, and whose life work is devoted to preventive and curative medicine, feel that perhaps we have some claim upon your great country and her hospitality; for while this city began as a religious colony when Maisonneuve and his little band of religious enthusiasts landed here May 18, 1642, and while the wilderness was conquered by priests and soldiers and statesmen, we like to recall that the first man to bring out his family and make his home in Canada was the apothecary Hebert, and that the first man to found a seigniory and settle it with inhabitants was Dr. Robert Giffard, Seigneur of Beauport. Nor do we like to forget that it was to this same Dr. Giffard that King Louis XIV gave the first patent of nobility granted an inhabitant of Canada.

It is pleasant, too, for us to know that in your later years a country doctor became Premier of Nova Scotia, your High Commissioner in London, and finally Prime Minister of Canada.

* Delivered before the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 14, 1931.

We feel that with such an history and tradition it is little wonder that you have builded such magnificent medical schools, laboratories, and hospitals with a splendid succession of clinicians and research workers from whose ranks we of the United States have so freely drawn and to whom the world owes much.

May I not add that, as Chief of the U. S. Public Health Service, and personally, I do not feel the need of any formal invitation to come into the territory of my friend, your Deputy Minister of Health, Colonel Amyot, who for years in the laboratory, later on the field of battle, and in the field of preventive medicine, has won the respect and affection of all of his colleagues, both on this continent and abroad. I am sure he has the same sentiments toward us. We accept reciprocally and without reservation the statements made and the procedure adopted by each other in international matters under our respective jurisdictions, and feel free to call upon each other for aid in times of stress and trial; while in international bodies we have nearly always voted together.

Throughout the ages it has been the custom of religious bodies to impose upon themselves various kinds of self punishment for the good of their souls and for after recompense, reward, and relaxation. Following their example this Association, in common with other similar scientific bodies, has imposed upon such of its members as are present the penance of listening to its President for the time being report upon the state of health of America, and upon its internal affairs. From year to year my predecessors have in pessimistic tones "viewed with alarm," or with triumphant voices have "pointed with pride." You are about to have this penance inflicted upon you.

Our Association, in common with all of the social clubs, voluntary and scientific organizations with which I am familiar, has suffered both in membership and in the collection of dues as the result of the worldwide economic depression. This Association has not suffered more than others and I see no reason for undue pessimism.

You are familiar with the fact that our Secretary, Mr. Calver, after a number of years of devoted service, resigned last spring. I am sure you all will join me in wishing him success.

I deem it one of the most fortunate events in the history of the Association that the Executive Board succeeded in persuading Dr. Kendall Emerson to become our Executive Secretary; for he has brought to us a wide experience here and abroad, a seasoned, sound judgment, a rare personality and wide acquaintanceship which it would be difficult to duplicate. I hope that he may be persuaded to remain.

I am sure that all of you who have an opportunity to read the

JOURNAL of the Association will agree with me that it has never been so well edited or contained such interesting and constructive material as during the past year, and that you will join with me in an appreciation of the work which has been done by the editor, Dr. Ravenel, and his coworkers.

The Association has suffered during the past few weeks an almost irreparable loss in the death of our President-Elect, Dr. William C. Hassler, Health Officer of San Francisco, and Dr. Lee K. Frankel, one of our former presidents.

I have known Dr. Hassler for 30 years; he was a man of the highest personal integrity and honor, a man of strong convictions and unswerving loyalty to his friends and ideals, and a loyal and devoted member of the Association. When I was asked several years ago to nominate a municipal health officer for a League of Nations Interchange in Europe I unhesitatingly suggested Dr. Hassler.

Lee K. Frankel we all knew and loved. Devoted to the betterment of his fellow man, he brought into his work a catholicity of interests, a splendid intellect and judgment, combined with a gentle nature which endeared him to all with whom he came into contact. Providence placed him where he had large opportunities for good, and he employed them to the utmost. Few men have done more for the health and happiness of their fellow men.

I suggest that we all stand for a moment with the prayer that their lives may serve to stimulate those of us who carry on their work.

Within the memory of many of us our race has passed through an epoch-making period unequaled in the annals of history; in its beginning little more was known of the etiology and epidemiology of disease than in the period of Hippocrates; synthetic chemistry was unborn; in applied physics the electric light and telephone were curiosities; in transportation the first electric tram was used; in sociology there was but the first awakening of the public consciousness of the duty and necessity of community effort and of the close interdependence of the different classes of society.

It is unnecessary for me to attempt to recall to such an audience the developments, the changes, the discoveries, during this period; we have eaten largely of the fruit of the tree of knowledge.

And into this great period came the World War and its immediate aftermath, the destruction of old landmarks in politics, in faith, apparently in all things that were.

The fever of war was apparently diverted into other fields of activity. The war itself had brought about the recognition of the necessity for group action in production, transportation, and health, no less

than in military movements; and indeed for the first time there was a consciousness of the dependence of military success upon concerted action by the civil population. Large sums of money and large powers were given for the purpose of improving the health and welfare of non-combatants. Not infrequently these powers and resources were placed in the hands of inexperienced but ardent patriots who for one reason or other were not in the military forces of the country and who were not familiar with the traditions, laws, and the orderly procedure of our forms of government.

It is perhaps significant, too, in this respect that it was during such an unsettled period that we had in the United States national woman suffrage for the first time, and that in all of the allied countries women were first brought into public life and political power.

Largely as a result of this increased consciousness of the importance of the public health movement having been awakened in the mass of our population, there has been a constantly broadening interest in the whole field. Not only has this been true among those elements interested chiefly in the humanitarian side, but, perhaps more important, industry and finance have been made aware of the vital significance of mental and physical well-being, not only to the individual, but to themselves and to government. Leaders in industry and finance have had brought to them the enormous dividends from true research by competent personnel.

During this same period our countries have had an unprecedented era of prosperity for the masses and the accumulation of great fortunes by individuals and corporations.

As a result of popular interest and demand on the one hand, local, state, and national health organizations have had their fields of activity broadened and their resources increased, while individuals have given enormous sums of money for the enlargement of existing, and the creation of new endowments and funds for the promotion of health and welfare, not only in the United States but throughout the world.

Able and willing to pay larger salaries and affording greater opportunities for usefulness than most governmental agencies, and with the wise advice of great men, an inestimable good has been done by many such endowments and nonofficial agencies, not only directly in the work they have done in field, laboratory, and schools, but perhaps even more in their education of the people and stimulation of governmental activities; for in any representative form of government, official action follows public sentiment and urge. The improvement in health conditions owes much not only to such members of the medical and allied professions, but to the non-medical socially minded men and women who have led such movements.

Unfortunately, however, the ease with which fortunes have been accumulated during this period has resulted in some instances in exemplification of the old adage, "Easy come, easy go." Many of us in a position to observe have been astonished at the ease with which often honest but incapable enthusiasts have secured large sums of money which have been dissipated in unwise and ill-directed research or investigations, and out of which has arisen a mushroom-like crop of so-called experts in various lines of health and welfare endeavor. We have had several examples of this during the past year. It is scarcely necessary to invite the attention of both medical and allied professions to the danger of such movements.

There is another problem which I feel it my duty to bring to your attention. I do this with some hesitation, because it is apparently a reflection upon scientific men as a body. Few men and women in medical and allied public health professions perhaps realize the effect of the rapid advances which are being made in industry, particularly in chemistry, upon the inter-relationship between industry, public health, and the public whom they serve. On the one hand large corporations are maintaining at great expense research workers and laboratories not only for purposes of advancing their interests by scientific research but for necessary defense purposes, just as their legal departments are maintained. On the other hand, our educational institutions, as well as individuals, have research laboratories, in most of which earnest work is being done in scientific spirit for the betterment of their clients and the public. Unfortunately, however, not all of the individuals who labor in the realms of science are perfect, and from time to time there is being brought to the attention of those of us in public office apparent attempts to threaten corporations which would seem to border very closely upon the high-jacking and blackmailing of other classes.

It seems to me to be a peculiar duty of this Association to exercise such influence upon its members as may best cause the retention by them of a true scientific attitude, whether it be after accepting an honorarium or in the course of governmental work. There is perhaps in this field of professional endeavor as nowhere else necessity for calm judgment, ability to recognize a balance of values, and intellectual honesty which after all is the most important attribute of a true scientist.

I venture to say that our Association itself should be particularly careful to observe that injunction of the Apostle, "Avoid the appearance of evil."

There is another condition in connection with the present state of

research, curative and preventive medicine which is well worth the serious concern of this Association and which has recently attracted the attention of our sister organization, the American Medical Association. The applications of the results of research in physics and chemistry to medicine are now rapidly made known to the public at large through the medium of the press, radio, and the moving picture.

Medicine, health, and hygiene are popular subjects for exploitation by both the trained and untrained. Advantage is being taken by certain commercial interests of this general interest in and superficial knowledge of such matters as the use of the different wave lengths of the spectrum, and of the existence in foods of the so-called vitamin group, until their extravagant and unwarranted claims in some instances result in danger to the public through their use by unskilled persons, and on the other hand in waste of the public's money for the purchase of articles and foods which have no particular value as curative agents. This constitutes a problem not only because of the financial aspect of the matter, but because it inevitably will result in disappointment, disillusionment, and contempt for real achievement in science.

That there has been a greater advance in both curative and preventive medicine during the past few decades than in any previous era is demonstrated by the results, as shown by lessened mortality and morbidity rates, as well as by the public interest, to which allusion has already been made, as manifested both by voluntary organizations and by largely increased appropriations by municipal, state, and federal governments. It is not necessarily disparaging to say that much of this effort and large sums of money have perhaps been dissipated in our progress. Medicine and sanitation are not alone in not having arrived at perfection. This is perhaps not the time or place to compare our efficiency with that of other lines of individual and governmental effort.

There is, it seems to me, at least in the United States, a most serious problem upon the solution of which we should concentrate our efforts during the coming years. That the United States is not unique in this respect is shown by the following quotation from that extremely interesting book, "Four Centuries of Medicine in Canada":

Public health in Canada is not yet freed from the politician who overrides the recommendations of the fully qualified public health official, makes appointments, as he sees fit, that destroy the morale of the entire working system of the department and indefinitely retard progress; nor is it freed from the untrained, unqualified official who to win recommendation will stoop to plunder.

I allude to the unsatisfactory condition which exists through almost all of our country in respect of the personnel in public health

work, especially regarding methods of selection, tenure of office, and compensation. Until recent years the only school for public officials was the school of experience, a rule of trial and error; and we know many leaders now living, and recall others dead, who have blazed the way for those of us who are still carrying on. But we must remember that public health work only a few years ago consisted chiefly of suppressing epidemic diseases, improving environmental conditions and safeguarding milk and water supplies; and such men grew along with our broadening conceptions and knowledge.

As a result of recent discoveries in the sciences and their application to public health, and no less as a consequence of the realization of the truths of the interdependence of individuals, and even of nations—that “no man liveth unto himself and no man dieth to himself,” that the strength of a people depends upon the moral, mental and physical health of its individuals—there has come a realization that the public health is influenced by environment, heredity, industry, economics, morality, education. The insanitary dwelling, the malarial stream, the syphilitic or idiot parent, the hazards of dusts or poisons, the living wage, temperate life, knowledge of diseases and how to avoid them, all come within the sphere of the present public health movement.

Nor is there justification for that artificial division of medical science into preventive and curative medicine. We are all members of the same body whose object is to prevent illness and pain and premature death. The interests of the people, as represented by government, are equally affected by helpless individuals, whether made so by heart disease, rheumatism, or paresis, as by smallpox or plague or poliomyelitis.

The research worker in the laboratory or in the field of epidemiology and the surgeon or physician at the bedside are all directly or indirectly, consciously or unconsciously, public servants working for the public good.

The ideal for which we aim is the application of every available means for the prevention of disease or injury and the provision of suitable treatment for all sick or injured. The problem is how this ideal may be attained with the greatest good to the common weal.

The solution is not to be found by mathematical formulas nor endemic nor ecumenical council; it will differ in some phases in different countries, states, or provinces, indeed in each community.

Neither bench nor bar, pulpit nor national military defense, needs men of greater professional training, of sounder judgment and courage than are required for the solution of these problems.

Public health is a specialty; but just as one who knows only op-

erative surgery is a poor surgeon, so should the efficient health officer have an intimate knowledge of the whole field of medicine. There is no longer any dearth of facilities and opportunities for the education and training of suitable men who choose as their life work leadership and general staff work in the field of public health; not only have individuals and foundations built magnificent schools of public health manned with able faculties, but there are opportunities in the federal and in some of the state and provincial services and laboratories for such training. Even more important in a broader sense is the commendable action which is being taken in some of our best medical schools to teach the preventive medicine and public health import of practising medicine to all medical students.

We may no longer consider as a complete or efficient state or local health organization a small group of salaried officials who confine themselves to the suppression of epidemics, the collection of vital statistics, and the enforcement of ordinances. These are necessary for staff and intelligence, for research in field and laboratory, but it is also necessary that the local state or provincial medical associations shall be brought into close relationship, that there shall be a mutual understanding with them and with voluntary agencies so that all may work together toward the common end. You will pardon me if I mention Detroit as one example of what may be done.

But to reach this goal there must be competent leadership. There have been in the past, and are now, many great leaders in the field of preventive medicine, pioneers, men of initiative, men with broad, almost prophetic vision; but I am sure that you will agree with me that there is room for much improvement, that the general average of health officers, particularly in the local field, leaves much to be desired, and that, consequently, there has been an unnecessary waste both of effort and money to accomplish the results which have already been attained and which makes much more difficult future progress.

During the past decade or so in the world of industry and finance, both in our countries and abroad, there has been occurring reckless advance in all lines of human endeavor without due thought for possible days of adversity and need. This has been true in public health and welfare as well as in other fields. We have reached the stage now where it is not only desirable and wise, but necessary, that we should not remain passive in a state of pessimism and despair but in a truly scientific spirit should carefully study the mistakes which have been made in the past and survey our course for the future. This is no less necessary for this Association than for governmental and non-governmental agencies, and I commend to your careful consideration a study

of the budgetary possibilities of the Association with a view to governing our activities accordingly.

The people of our European and American regions came out of the World War feeling that the old order had changed and all things were new in the social and political world; nations and individuals were torn from their moorings, swept away from their courses. Scientists and sociologists entered into a decade unparalleled in its feverish activity. The veil of mystery was torn from many secrets of chemistry and physics, and the habits and very thoughts of people were changed. History and experience were considered with contempt, and warnings of the thoughtful were but voices crying in a wilderness.

Knowledge came, and with it apparently universal wealth and prosperity; but wisdom lingered.

It is not necessary for me to tell you that this old world is a very sick patient now; following the period of maniac excitement there is a physical, mental, and moral depression. Around her are many would-be physicians, with nearly as many diagnoses and prognoses. Many are mistaking symptoms for causes, and are suggesting empirical or quack remedies; others are nihilistic in their therapy and pessimistic in their prognosis; while, thank God, there are others earnestly trying to find the true causes and their remedies.

It may well be that future generations will smilingly refer to this period as a beneficial purge given us in the Dispensation of Providence.

Meantime, may I not appeal to you of the medical and allied professions, trained as you are to contact the realities, to "sit steady in the boat" and, avoiding panic and pessimism, assist those whom we have in authority in our respective governments to resist the urge to give either stimulants or narcotics or remedies which, while they may give temporary relief, may cause irremediable injury to our countries and retard their convalescence.

I am particularly glad on this occasion, both on behalf of the Association and personally, to welcome our colleagues, Sir Allan Powell, Drs. Buchan, Porter, and Fenton, who have come to us from the Association of Medical Officers of Health of Great Britain. I am sure that they have brought with them some of the wisdom and experience of that great Mother Country to whom we have looked in the past for leadership and inspiration in matters of public health.

Drought and Health*

MAZŸCK P. RAVENEL, M. D., F. A. P. H. A.

University of Missouri, Columbia, Mo.

HISTORY abounds in instances of diseases following shortage of food, which may range from slight deficiency to absolute starvation. The Old Testament recounts many instances in which famine was sent upon the land resulting in pestilence and death. According to the belief at that time, these occurrences were due to the anger of God over the disobedience of his commands by his people, or the worship of false gods by other peoples.

And I called for a drought upon the land, and upon the mountains, and upon the corn, and upon the new wine, and upon the oil, and upon that which the ground bringeth forth, and upon men, and upon cattle, and upon all the labor of the hands.¹

A typical story is that of Elijah and Ahab. After some 3 years of drought and famine, Elijah entered into a contest with the prophets of Baal over calling fire down from heaven to consume a sacrifice. He won, and after slaying the prophets of Baal by the brook Kishon, Elijah said to Ahab:

Get thee up, eat and drink; for there is a sound of abundance of rain. . . . And it came to pass in the mean while, that the heaven was black with clouds and wind, and there was a great rain.²

While modern science makes us reject the etiology accepted by the Old Testament peoples, these stories are interesting in showing the correctness of their observations and the recording of the facts.

There is no doubt that when there is lack of food on a large scale, such as may affect a community or a people, pestilence is sure to follow; and there is a widespread belief that famine is a direct cause of pestilence.

The lack of food, either as regards quantity or quality, certainly lowers resistance to certain infections, though not to all. The direct effect of starvation is a lack of vitality and increased susceptibility to disease. During times of food shortage an indirect effect is always seen in a lack of hygienic measures and cleanliness, an increase in

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 15, 1931.

vermin, and the presence of other factors which favor the spread of certain diseases, especially typhus fever, plague, relapsing fever, and others of similar character.

During the World War we had a striking example of the effects of lack of food, which was deficient not only in quantity but also in quality, in the so-called war edema seen among the people of the Central Powers. This was clearly the result of underfeeding on a ration which was low in protein and deficient in fat. It was followed by displacements of the internal organs due to the loss of the supporting fat, and deficiency diseases such as rickets. The incidence of tuberculosis was increased and infectious diseases became more prevalent.

The most common cause of lack of food is failure of crops, which is usually more or less local. Where the means of transportation are lacking, or are destroyed, as during the great flood in the Mississippi Valley, starvation may occur though abundance of food is near at hand.

In 1921-1922, while some 25 million people were starving in the Volga region and several million died, there was a great surplus of food in America, Australia, Argentina, and even in parts of Russia. In 1930, while millions were starving in China, wheat was a drug on the market in practically all other countries.

While this discussion, as far as the public health aspects go, centers on the problems of drought, the Mississippi flood must be remembered, as the drought conditions now existing have been unquestionably aggravated by the destruction which took place during that disaster.

According to the U. S. Public Health Service, 22 states are included in the drought stricken area of this country, most of these being in the middle, south, and southwest.

Conditions became so bad that in February, 1931, Congress appropriated \$2,000,000 to our Public Health Service for medical aid in these states. This was a strictly emergency measure, and the appropriation will cease to be available on June 30, 1932. It is perhaps needless to say that most of this money will be expended in the rural areas, the inhabitants of which have lost not only their staple food crops, but also their vegetable and garden crops. The rôle played by vitamins in nutrition emphasizes the seriousness of this latter item.

The engineering features of the situation are amply provided for in the reports which are to follow. It need only be said that throughout extensive areas not only have the crops been lost but there has also been a great shortage of water for household purposes and for cattle. The direct result has been that water has been hauled from unprotected streams and springs, wherever such sources were available, for drinking and to fill cisterns.

It is perhaps too early to form a definite opinion as to the effect of this measure as other factors have been concerned, the relative value of which we are unable to determine at present. In general it may be said that there has been an increase in the prevalence of intestinal troubles, particularly diarrhea and enteritis in children under 2 years of age. Other papers will give the details of the outbreaks of intestinal trouble observed in some of the eastern states, especially at Charleston, W. Va., and cities located along the Ohio Valley.

In Arkansas, Dr. Garrison, the Health Officer, reports the amount of malnutrition among rural children for 1930 is double that for 1929. The disturbed conditions relating to private, and in some cases public, water supplies were counteracted by intensive precautionary measures.

In that part of Missouri south of the Missouri River many cases of malnutrition have been observed, intestinal disorders have been common, and typhoid fever has increased markedly, as shown in the following figures:

Total for years 1929 and 1930:

1929—614 cases reported

1930—793 cases reported

Indicates an increase of 29 per cent.

Total for state last 6 months of 1929 and 1930:

Last 6 months 1929—341 cases reported

Last 6 months 1930—647 cases reported

Indicates an increase of 90 per cent.

Total for 55 drought counties 6 months of 1929 and 1930:

Last 6 months 1929—156 cases reported from 55 drought counties

Last 6 months 1930—352 cases reported from 55 drought counties

Indicates an increase of 125 per cent.

Total for 59 non-drought counties 6 months of 1929 and 1930:

Last 6 months 1929—185 cases reported from 59 non-drought counties

Last 6 months 1930—295 cases reported from 59 non-drought counties

Indicates an increase of 59.5 per cent.

The conditions in regard to typhoid fever are not quite so bad as the data seem to indicate, as the great increase was due largely to an epidemic in one county in which local factors seem to have played a part.

Reports from the directors of the units established for the drought emergency show a comparatively high incidence of malnutrition, as evidenced by underweight, and many cases of rickets have been observed, though it must be remembered that data for other years are not available.

In Tennessee there was a slight increase in typhoid fever, from 1,575 cases and 307 deaths in 1929 to 1,732 cases with 324 deaths in 1930, the rates being 11.8 and 12.4 for the 2 years respectively. The death rate from diarrhea and enteritis under 2 years of age increased from 23.8 in 1929 to 28.2 in 1930.

A bright spot in the returns is that there has been a decrease of almost 50 per cent in the cases and 20 per cent in deaths from malarial fever. It seems fair to believe that some of this decrease, at least, is due to drought conditions, although Tennessee has for some years past been carrying out an intensive anti-malarial campaign including the screening of houses.

In Kentucky, A. T. McCormack, M.D., State Health Officer, reports 100 more deaths from typhoid fever than in 1929, almost all of which occurred in counties without health organizations, and where little or no immunization was done. The death rate among children under 2 years from diarrheal diseases has been considerably increased, while outbreaks of diarrhea and dysentery have been reported.

In the counties with health organizations, there was good coöperation on the part of the people, and a large part of the drinking water was boiled. Nearly 1 million persons were immunized against typhoid fever.

The incidence of pellagra has increased, though exact figures are not available.

In Oklahoma, the crop failure caused defalcation in taxes, which was responsible for the breaking down of county health service, while scarcity of food led to migration to larger centers of population, and especially to the oil fields. This increased the problems of the health departments.

The most marked effects were noted during the last 6 months of 1930 and the first 3 months of 1931. The incidence of typhoid fever was slightly greater in 1930 as compared to 1929, but decreased for 1931. Extensive educational and immunization campaigns were carried out.

Dysentery followed the same general course, some increase in 1930 and a marked decrease for 1931. Pellagra has shown a great and steady increase, 219 cases for 1929, 298 for 1930, and 441 for 1931. These figures are for 6 months of each year only, in order to make them fairly comparable with 1931. Reports from the psychiatric hospitals indicate an increase of nearly 20 per cent in the number of admissions of pellagrins for 1930 over 1929.

It is manifest that this paper gives an incomplete account of what has happened. The ultimate effects of the drought will not be known

until very much more complete studies have been made and a longer time has elapsed. Except for the intestinal outbreaks studied by Dr. Veldee, the general effects of the drought on health are those which have been recorded for ages in the literature. We will unquestionably derive beneficial effects through an arousing of general interest, the stimulation of health officers and public health workers, and the recognition of the disaster by Congress. Undoubtedly the final effect will be precautions to forestall similar disastrous results in the future.

REFERENCES

1. Haggai, 1: 11.
2. I Kings, 18: 41, 45.

How Old Is the Word "Antiseptic"?

WHILE the words "antiseptic" and "asepsis" seem to be modern expressions, we find "antiseptic" in medical literature in the middle of the 18th century. It was also commonly used by the laymen and we find the following good advice in the publication, *Gentleman's Magazine* (1751): "Myrrh is twelve times more antiseptic than sea salt." Moreover I note the word antiseptic defined in St. Blancard's lexicon (1777) as follows: "Antiseptica, sunt remedia interna et externa, quae putridini resistunt."

There is a very interesting letter by George Foster, October 13, 1791 (Herrig's Archiv. Bd. 93. S. 41), wherein he describes treatment during an illness, "I had no desire to eat, etc., all the symptoms of a general breakdown. Drank quantities of vitrol acid and ate kraut conserve. In short, I was kept antiseptic and after a few days I became better. I now felt hollow and empty and very weak on my legs."

The kraut conserve was believed to be antiscorbutic. Chlorine and its combinations, sodium chloride and chloride of lime, were known as strong antiseptics through Semmelweis, especially in Wien and Budapest. Iodine later first became pushed to the foreground.

In Lister's time a number of antiseptics were used, for instance, alcohol and glycerine.

The surgeons of that time almost without exception used antiseptics with the idea of making decomposition harmless. Semmelweis, who used antiseptics on the hands, the main carrier of infection, to prevent infection, was one exception. "You should work with clean hands!" said Semmelweis, while Fleetwood Churchill said, "A gentleman's hands are clean" (E. Ebstein, The use of gloves in obstetrics in the year 1758. *Monatschr. f. Geburtsh. u. Gynäk.*, 79: 39, 1927).

Lister's teachings found little sympathy in England. They explained that the Germans are known as dirty people, therefore antiseptics might be necessary there, but in England they are superfluous.

It was not necessary in England to demand the cleaning and disinfection of the finger nails because a gentleman cleans his finger nails in his sleeping room.—Dr. Erick Ebstein, Leipzig, *München. med. Wchnschr.*, 76: 2168, 1929.

The 1930-1931 Drought and Its Effect Upon Public Water Supply*

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THE 1930 drought has dramatized as never before the need of safe, adequate, palatable, public water supplies. The widespread interest of the general public in the drought, the suffering it caused, the financial loss to those living in farming and rural areas, the anxiety of water works men and those in industries dependent upon water, all have been factors making for more adequate water supplies and for more completely equipped and better operated water filtration plants.

This drought and the disastrous flood over the Mississippi watershed in 1927 have acted so to accentuate public health work in the mind of the everyday person that public health machinery in all the states lying within the zone of these catastrophes is now far more efficient than it was 5 years ago.

Each state sanitary engineer in the sorely distressed states has summed up the conditions which have existed in 1930 and to April, 1931, and it is from these supervisors of public water supply and sanitation who are constantly in touch with such conditions all over their states that the material in this brief summary has been obtained. In each of the affected states, the Division of Sanitary Engineering of the State Health Department was able to lend immediate help when water supply emergencies arose in the cities over their state.

The gigantic size of the problem is difficult to realize but some definite conception can be gained by picturing the states of Maryland, Pennsylvania, Ohio, West Virginia, Virginia, and Kentucky which embrace a territory of 200,000 square miles, and imagining water standing 2 feet deep over this entire territory. That is the amount of water which these 6 states did not get in 1930 and hence was not available for vegetation, streams, ground water supplies, and the manifold other water uses. Is it any wonder that emergencies were created such as were never known before?

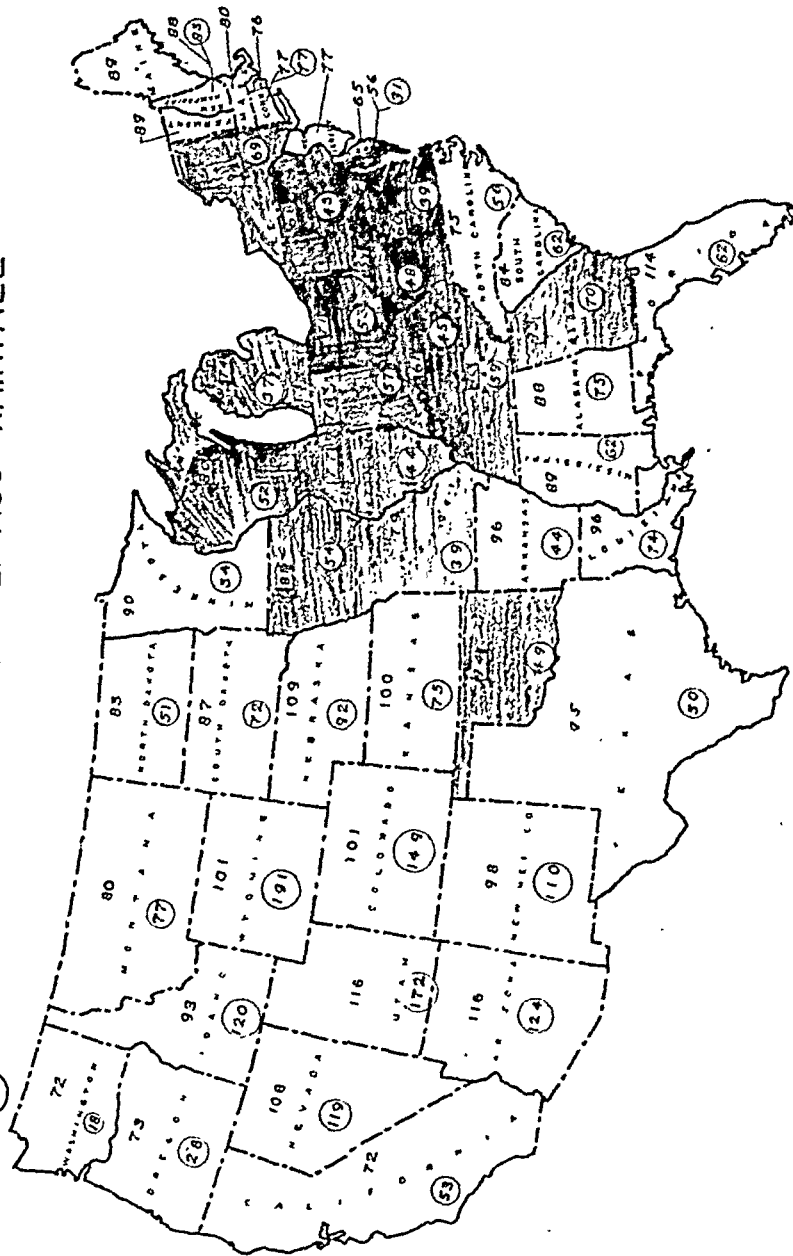
* Read before the Public Health Engineering Section of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 15, 1931.

These 6 states—Maryland, Virginia, Pennsylvania, West Virginia, Ohio and Kentucky—according to Prof. Floyd Nagler of Iowa, who summarized the drought situation in Iowa before the Iowa Water Works Conference in 1931, had approximately 60 per cent only of the normal annual rainfall and they constituted the heart of the drought area where most severe conditions obtained.

Prof. Nagler prepared maps showing the percentages of normal precipitation for July and August, 1930, in some cases to run in the zone of 30 per cent and 40 per cent of normal. He emphasizes the

1930 DROUGHT

83 PERCENT OF NORMAL ANNUAL RAINFALL
 70 PERCENT OF NORMAL JULY-AUG RAINFALL



fact that the excessive evaporation rate produced by the high summer temperatures with extremely low rainfall was an additional factor in causing the unprecedented depletion of stored water supplies and the unusual depletion of shallow ground water supplies from which evaporation takes place by capillary action and transpiration.

Every state which has analyzed the present drought situation is now commenting upon the deficient ground water supply and the possibilities of trouble arising in the fall of 1931 from this shortage.

The drought experiences of these 6 states have been outlined at some length in the various state water works meetings and before the American Water Works Association convention at Pittsburgh in May. However, it may be of interest to look at the problem from the standpoint of the entire area, considering the different types of problems which arose, how they were met, what new angles of water supply have been stimulated, and note the aggregate effect of the whole on public health.

Before considering the drainage basins of the Ohio and Potomac Rivers where lay the heart of the drought, we shall look for a minute at the fringe of states surrounding these, where drought conditions had to be met also.

CONDITIONS IN FRINGE OF MAIN DROUGHT AREA FOR 1930 AND FOR JULY-AUGUST

New York—Percentage of normal annual rainfall, 82; July-August, 69. Holmquist reports 65 public water supplies seriously affected by the drought, and several cities taking action to obtain permanent, enlarged water supplies. Rural supplies of thousands of farmers failed and they had to take their stock miles for water. Three hundred and seventy-eight water works managements were warned of a possible drought in 1931 on account of the sorely depleted ground water.

Illinois—Percentage of normal annual rainfall, 77; July-August, 44. Ferguson had 15 communities affected where emergency measures were adopted. So eager were farmers for rain that even the first run-off from roofs laden with dust was directed into the cisterns.

Michigan—Percentage of normal annual rainfall, 74; July-August, 37. Rich reports no real suffering, but the ground water levels were lowered.

Wisconsin—Percentage of normal annual rainfall, 82; July-August, 52. Warwick states that streams and lakes were low with luxuriant algal growths, causing widespread tastes and odors.

Indiana—Percentage of normal annual rainfall, 76; July-August, 57. Finch says that the state experienced troubles but escaped alarming water supply deficiencies.

Iowa—Percentage of normal annual rainfall, 81; July-August, 54. Wieters advises that Iowa had many cities seriously embarrassed, but no complete failures—ground waters down to low ebb in some cases.

Missouri—Percentage of normal annual rainfall, 79; July-August, 39. John-

son advises that many supplies were so depleted that supplementary sources were drawn upon. Few cities were actually short of water.

Oklahoma—Percentage of normal annual rainfall, 94; July–August, 49. Darcey claims that no municipal supplies failed completely. However, taste and odor troubles in surface water supplies were so intense that citizens would not use the public supplies. Old wells, springs, and cisterns were resorted to, resulting in a great increase in the number of dysentery cases throughout the state. Twelve cities have adopted ammonia-chlorine control of taste since January, 1931.

Tennessee—Percentage of normal annual rainfall, 80; July–August, 59. Morton reports considerable trouble occasioned in some 13 cities and towns when springs and wells failed. Uses of water were restricted and the chlorination of emergency water supplies practised.

Georgia—Percentage of normal annual rainfall, 93; July–August, 70. Clarkson states that 8 cities found it necessary to develop emergency water supplies. Much permanent improvement has been obtained in construction and operation of water purification plants.

THE HEART OF THE DROUGHT AREA

The heart of the drought area of 1930–1931, where the outstanding difficulties with respect to public water supplies were encountered, lay on the watersheds of the Ohio and Potomac Rivers for the most part. The percentages of normal rainfall in 1930 were:

RAINFALL JULY–AUGUST, 1930

	Percentage of Normal	
Pennsylvania	Annual	68
	Jul.–Aug.	43
Maryland	Annual	56
	Jul.–Aug.	31
West Virginia	Annual	59
	Jul.–Aug.	48
Ohio	Annual	71
	Jul.–Aug.	53
Virginia	Annual	60
	Jul.–Aug.	39
Kentucky	Annual	61
	Jul.–Aug.	45

It will be of interest to start at the upper state in the Ohio River drainage basin—Pennsylvania—and to point to some of the outstanding types of difficulties found in this 6-state territory, covering the major parts of the Ohio River-Potomac River watershed.

PENNSYLVANIA

Public health work has been stimulated in this state on account of the drought. The Secretary of Health, Theodore B. Appel, M.D., dispatched Pennsylvania's 5 completely equipped automobile laboratories, which are usually used for field stream pollution investigations, into all parts of the state to assist cities, towns, and rural communities in obtaining safe water supplies. These started their work in July,

and in the next critical 6-months period, 5,000 public and private water supplies were examined in 40 counties. Federal aid was made available in March, 1931, and the drought relief work still goes on.

In 48 counties in Pennsylvania, more than half of the state, 125 cities and towns were obliged to use auxiliary or emergency water supplies, or both. The State Health Department feels that the unusual effort to keep emergency water supplies safe was responsible for the fact that no increase in typhoid fever was noted.

Howard E. Moses, Assistant Chief Engineer, State Health Department, summing up some of the outstanding experiences in Pennsylvania in 1930, quotes Kendall Hoyt,¹ to the effect that 1930 by a small margin was drier than any previous extended drought, but those in 1881, 1894-1895, and 1910 were comparable in extent, rainfall deficiency, and attendant heat. The western portion of Pennsylvania suffered most, and L. S. Morgan, District Engineer in that area, summarizes a few of the chief water supply difficulties experienced in that section, the seat of the bituminous coal fields, for which the acid mine drainage, with little or no dilution, was largely responsible. He gives the following 7 effects of the highly acid, very hard water on filter plant operation:

1. Inadequate capacity of chemical feed equipment
2. Production of abnormal quantities of sludge
3. Inadequate sedimentation basin capacity
4. Inadequate facilities for sludge removal
5. Shortened filter runs
6. Increased cost of treatment
7. Failure to reduce hardness to satisfactory point to send into city mains

In one emergency at Apollo, Pa., the Kiskiminitas River, a highly acid stream, had to be used, and a hardness of 1,900 p.p.m. was recorded. The water plant was designed to handle only 300 p.p.m. hardness; hence the difficulties are obvious.

One particular feature was noted at Pittsburgh and other cities in Western Pennsylvania when the drought finally broke, namely, the inability to hold a residual chlorine in the water, for the chlorine demand far outstripped the range of the disinfection equipment. The characteristic "rivery" taste, one of mouldy, musty nature, started to prevail along the Ohio in Western Pennsylvania and continued down to the mouth of the river at Cairo, Ill. All efforts to counteract it failed, except possibly activated carbon treatment.

MARYLAND

This state experienced the greatest deficiency in rainfall of any state in the 1930 drought. The damage to agriculture was tremen-

dous, the State Agricultural Extension Service estimating a 40 million dollar loss to farmers with a fire loss of approximately $\frac{1}{2}$ million dollars. Herds of cattle were often seen lying in groups in the fields exhausted by the lack of water. Maryland had 23.4 inches of rainfall as compared to a normal of 41.8 inches annually.

There were several outstanding results of this drought. The public water supply for 56,000 people living in towns and cities on the outskirts of Washington, D. C., failed entirely. These communities are supplied by the Washington Suburban Sanitary District, the water coming from storage and filter plants on the Anacostia River, consumption being approximately 3 m.g.d. In July these reservoirs were very low and late in the month connections were made with the District of Columbia water system.

Mention should be made of the observations of Tarbett and Frank, of the U. S. Public Health Service, that while the last dregs of water were being drained from the Anacostia storage system, with considerable algae present and the river very low, many families using this water experienced what appeared to be the same type of dysentery or intestinal disorder which prevailed later in West Virginia and in the Ohio River cities of Louisville and Ashland, Ky., and Cincinnati and Portsmouth, O., when the Ohio was flushed out in November and December, 1930. While many families living in the fringe of towns about the District of Columbia had this trouble, there was no evidence of it in the District itself in July and it completely disappeared when the District of Columbia water supply was substituted.

Water Supplies Destroyed by Salt Water—Another notable effect upon water supplies located along streams discharging into coastal waters was the encroachment of the saline waters upstream. This was observed in Maryland, Pennsylvania, and Virginia, and caused the abandonment of certain public water supplies for domestic and drinking purposes.

Havre de Grace and Perry Point, Md., watched the salty waters diffuse up stream, increasing the salinity from 7 p.p.m. in May to 200 p.p.m. in September, reaching a maximum of 885 p.p.m. in December.

Chester, Pa., on the Delaware River, and certain Virginia cities also had their public water supplies affected in this same manner. The State of Pennsylvania eventually received an appropriation of \$50,000 during the 1931 term of legislature to study further the salinity of the Delaware River and its possible future effect upon the public water supplies of Chester and Philadelphia.

Unusual Fish Mortality—The salt content in the Chesapeake Bay and its tributaries was greatly affected by the great drought of 1930.

Unusual fish mortality was reported in the Magothy and Severn Rivers and the Department of Zoölogy of University of Maryland made careful studies of it. Dead and dying fish appeared in great numbers, and the dying fish were observed swimming about breaking water with their mouths and pushing their heads upon shore, ordinarily an indication of oxygen deficiency or high pollution. These disturbances took place about November 5, and continued for about 2 weeks. The conclusions of the Department of Zoölogy were that the salt invasion was responsible for the fish mortality since there were no unusual conditions of pollution, temperature or oxygen content.

In connection with this it is of interest to note that during November and December, 1930, and January, 1931, similar effects on fish were observed in the Kanawha and Ohio Rivers at Charleston, W. Va., Ashland, Ky., and Portsmouth, O., which occurred when tastes in public water supplies were bad and outbreaks of intestinal disorder prevalent. The water in these streams may have contained some unusual chemical substance from decomposition products.

OHIO

Ohio suffered grievously in the southeastern sector. Cities depending upon storage saw the reservoirs entirely dry up and the state sanitary engineers took charge of the emergency relief work. Abandoned mines and drilled wells saved the day.

One of the relief measures in Southern Ohio was the authorization by the 1931 legislature of the expenditure of \$10,000 for extending the scope of the "Seal of Safety" wells located strategically along the highways to serve both tourist and farmer. This work was to be done by the Sanitary Engineering Division of the State Health Department. Sixty-five wells are now being drilled at a cost of approximately \$150 each. During March, 1931, a warning was sent out to all public water supply managements that 1931 had the appearance of a drought year so far as ground water supplies were concerned, for the level of the ground water had fallen from 3 to 7 feet and was still going down.

Ohio has many cities located on the Ohio River opposite the states of Pennsylvania, West Virginia, and Kentucky, and it will be of interest to note the types of weapons employed by the trained chemists in charge of modern filtration plants using the Ohio as the source of public water supply.

When the Ohio finally began to flow in late December, 1930, and January, 1931, the troubles predicted a month previous by the Ohio State Health Department engineers materialized. A musty, rivery, nauseating taste persisted in both raw and purified water despite all

efforts to remove it. Bellaire and Ironton, O., shifted over to excess lime as a disinfectant, discontinuing chlorination. Delaware, O., on a tributary, used potassium permanganate successfully for 3 days.

Warren, Marietta, East Liverpool, Pomeroy and Cincinnati, O., used the ammonia-chlorine process, which was successful in preventing phenolic tastes but did not overcome the disagreeable "rivory" taste which predominated. Great difficulty was encountered in maintaining a residual chlorine at Warren, on the Mahoning River, due to some unusual condition in the water—high organic content possibly. In one case 7 lb. per m.g. failed to show a trace of residual chlorine.

At certain other cities—Chesapeake, O., furnished water by Huntington, W. Va., and at Newcastle and South Pittsburgh, Pa.—the use of activated carbon was successful in removing the rivory, musty taste. Approximately 50 lb. of Nuchar per m.g. were used. The treatment costs approximately \$4 per m.g.

Ohio River Cities Experience Sickness—In a paper presented by F. H. Waring, Chief Engineer of the State Health Department of Ohio, before the Indiana Section A. W. W. A. in February, 1931, mention is made of the widespread complaint about the water in Cincinnati and the Ohio River cities of Ironton and Portsmouth because of objectionable tastes which were accompanied by an outbreak of so-called "intestinal influenza." Two theories were advanced by medical men: that a type of influenza prevailed affecting the intestinal tract; and that there was a toxic property in the river water by reason of the decomposition of organic substances of vegetable and animal origin.

Bacteriologically, the public water supplies where these intestinal disorders prevailed met the U. S. Treasury Standards of safety. The State Health Department has taken the stand that it does not know which theory is correct but such a situation warrants the expenditure of considerable funds by a city water department either to purchase or install equipment, or for the purchase and use of additional chemicals in the water treatment.

The result of the Ohio experience on the whole is that these Ohio River cities are now installing or considering the installation of ammonia-chlorine or activated carbon equipment in order that they may be able to cope with any type of tastes, drought or no drought. New ideas on water treatment have been evolved as a result of the drought and the practical remedies should be applied.

KENTUCKY

At the peak of the drought in Kentucky, one-third of the public water supplies of the state were forced to adopt emergency measures.

The far famed Kentucky blue grass section was scorched brown, and water became a very precious article. One might characterize the city water supplies of this section as "transported water supplies," for this limestone area depends upon storage reservoirs and these had become bone dry.

Shelbyville, 30 miles from Louisville, drank the Louisville water. It was hauled in by means of sixteen 10,000 gal. railroad tank cars daily from August 7, 1930, to February, 1931.

Richmond, after using up 245 m.g. of stored water and a private lake with emergency chlorination, began shipping 210,000 gal. of water daily on the L. & N. Railroad from Valley View.

Lexington was threatened in September when the 1,640 m.g. storage became low, and rushed to completion a 6½ mile emergency line to the Kentucky River which was completed in record time.

Louisville had an ample supply of water but was bothered by an unusual biological condition. The Ohio River, though green and clear, had an algal and plankton content of many thousands per c.c. instead of hundreds, as is normally the case. Despite all types of treatment the water remained unpalatable and was not satisfactory as a beverage.

The significant public health note in Kentucky during the drought was the action of the State Health Department in sending out anti-typhoid vaccine to approximately 1 million people. People were drinking water from all sorts of places and therefore this wholesale immunization was deemed advisable. Nearly ¾ million people were thus protected.

In December, 1930, and January, 1931, came a widespread epidemic of intestinal disorders in Louisville which was investigated by M. V. Veldee, M.D., of the U. S. Public Health Service, who had earlier reported upon an intestinal outbreak of rather large proportions at Charleston, W. Va., on a tributary of the Ohio River.

WEST VIRGINIA

Next to Maryland, West Virginia had the least rainfall of any state, 59 per cent of the normal. The wheels of industry were stopped in some sections by complete disappearance of streams. The Tygart Valley River in the northern part of the state, 1,340 square miles drainage area, was reduced to a flow of 1.5 cu. ft. per second.

The Elk River, 1,550 square miles drainage area, which is the source of water supply for the capitol city, Charleston, dried up for practical purposes and an unprecedented case of intense pollution and a serious public water supply emergency were created by reason of the Elk River flowing up stream carrying gross sewage and garbage pollution from its junction point with the canalized Kanawha River.

Charleston, with a privately owned water supply, tried all resources to get rid of the objectionable, nauseating odor, but to no avail. The bacteriological counts of the filtered water were satisfactory but the sewage and garbage, organic pollution was too great, producing a nauseating taste and odor which persisted all summer, reaching its worst in late October, 1930.

Early in November 5,000 to 8,000 people living in the city of Charleston suffered from temporary intestinal disorders characterized by a sudden onset, pain in the region of the stomach, usually nausea or vomiting or both, and followed by diarrhea of varying severity. People flocked to bottled waters and miscellaneous springs and wells. The state health authorities were assisted in their investigations by R. E. Tarbett, Sanitary Engineer, and M. V. Veldee, M.D., epidemiologist of the U. S. Public Health Service. The following conclusions were reached:

1. Too gross pollution existed at the regular water intake due to back flow from the sewage zone.
2. The raw water in the stream had zero dissolved oxygen at times.
3. The raw water count was excessive—200,000 per c.c.
4. The *B. coli* content of 10,000 per c.c. was too high for safety.
5. The organic matter, algae and protozoa were extremely high, calling for a 20 lb. per m.g. chlorine dosage to supply the chlorine demand.

An emergency water intake in the Kanawha River was proposed and on November 11 approved, and construction started, work being completed in January, 1931, just before the heavy rains came.

Intestinal disorders were also noted at another West Virginia city—Weston—where the raw water was grossly polluted due to heavy sewage concentration. Here also nauseating, musty odors and tastes prevailed. Another Ohio River city—Sistersville—gave a record of a large number of cases of intestinal disorder, coincident with the bad taste troubles in the late fall months.

With the Charleston, Weston, and Sistersville records of intestinal disorders of many thousand people in these 3 cities on file, and the epidemiological evidence indicating that it was in some way connected with the public water supplies—even though these were purified in modern plants and gave a safe bacteriological test—it would appear that research should be undertaken to show whether a heavy organic or algal load on a water supply may in any way affect the health of the consumers.

Stream pollution in West Virginia has been brought into the spotlight by these unusual experiences and the new State Water Commission, created by the legislature to handle these problems, is expected to

make some definite decisions which will limit sewage and industrial pollution and start a reclamation program.

VIRGINIA

The water supply conditions in Virginia called for continual alertness on the part of the Sanitary Engineering Division to cope with rapidly developing emergencies. The far famed and productive Shenandoah Valley lay parched and brown from May until December, with the rural communities suffering most from loss of crops. Eighteen cities and towns had to adopt emergency measures, and the records of the State Health Department show the following large amounts spent to get water:

COST OF VIRGINIA EMERGENCY WATER SUPPLIES

Newport News	\$83,000
Front Royal	19,000
Harrisonburg	27,000
Bluefield	40,000
Staunton	8,000

The types of difficulties in Virginia were much like those developing in the limestone areas of Kentucky, for the territories are much the same, depending largely on impounded supplies in the mountains. Many emergency hypochlorite disinfection plants were set up and all emergency supplies were heavily treated with "H. T. H."

Chlorination of emergency supplies was one of the major means of protection. A unique means of relief was adopted at the Marine Base at Quantico, where salinity entered the picture. Quantico, supplied from Chapawansic Creek, saw this creek go lower and lower until the water works could only be operated intermittently. Then, barge service was commenced, filtered water being taken on at Norfolk and Indian Head. The barges leaked salt water in some cases and entire loads that were too high in salinity had to be wasted. In tidewater, Virginia, the salt water diffused further up stream than ever known before—16 miles up the Potomac—and had a marked effect upon the aquatic life in the rivers. On the whole the section of Virginia suffering most lay between the Blue Ridge Mountains and the Allegheny and here the major amount of emergency relief work had to be done.

SUMMARY OF TYPES OF TROUBLES

Reduced Stream Pollution—One outstanding and persistent trouble in all affected states was the prodigious algal growth in streams and storage basins with the accompanying organic load and the resulting nauseating tastes and odors. In many cases there were no known means of relieving the condition.

The series of 53 artificial lakes in the Ohio River between Pittsburgh, Pa., and Cairo, Ill., into which sewage and industrial wastes poured, and from which there

was almost no flow except by displacement by polluted water, constituted basins where pollution progressively increased throughout the summer months. It is no wonder that it was difficult to treat water from these basins so as to make it potable even in modern purification plants.

The "Great Drought" has warned the people of the Ohio drainage basin that pollution of their river has reached the limit and that the coöperative principle successfully carried out by the 11 states on the basin in eliminating phenol, a damaging trade waste, should be extended to other industrial and to sewage wastes. The Interstate Stream Conservation Agreement of 1924 should without delay be enlarged in scope to reduce stream pollution on this great waterway.

Taste and Odor Control—Research work has been stimulated by the drought along the lines of taste and odor control, and the principles being developed in the laboratory were given an extensive application over the eastern part of the United States. Oklahoma lists 12 cities which have adopted ammonia chlorine control of tastes and odors since January, 1931. Ohio, West Virginia, and Pennsylvania now have many plants equipped with both ammonia-chlorine and activated carbon treatment units and it seems likely that these processes will soon be incorporated into routine plant operation nearly everywhere.

Intestinal Disorders Show Need for Further Research on Heavy Organic Loads with Algae—The several instances over this drought area where definite intestinal disorders have appeared associated with bad tastes and heavy organic loads cannot be overlooked. The towns and cities around Washington, D. C.; Charleston, Weston and Sistersville, W. Va.; Ashland and Louisville, Ky.; and Portsmouth, Ironton and Cincinnati, O.; all testify that something unusual in the way of intestinal disorders appeared during the drought, and it may be that algae in heavy concentrations with the resulting organic load may be a factor in bringing about these troubles.

It is significant that Charleston, W. Va., on the Kanawha River, where the organic load on raw water was heaviest, as evidenced by a chlorine demand of approximately 20 lb. per m.g., experienced the most severe type of intestinal disorders, while Ohio River cities where there had not been the opportunity for such tremendous putrefaction of organic matter were not so severely affected. An unusually close check was maintained at Charleston upon the bacteriological quality of the effluent so that a water meeting the U. S. Treasury Standards for safety was delivered at all times.

R. F. Goudey,² Sanitary Engineer, Department of Water and Power, Los Angeles, Calif., in discussing sewage reclamation in the Los Angeles Metropolitan area, mentioned the possibilities of using purified sewage as a source of public water supply in the following words:

"When sewage has been completely treated in a super-activated sludge plant and is then put through the entire gauntlet of water purification, why should it not be used directly for domestic purposes? Why should its reinstated purity be lost by using the water for *less noble* purpose?"

When we have these unexplained evidences of a severe intestinal irritant as evidenced in the cities of the Ohio River basin during the drought, we should find the answer before the adoption of reclaimed sewage for drinking purposes.

Salt Water Invasion of Water Supplies—Public water supplies on the coastal rivers in Pennsylvania, Maryland, and Virginia were affected by the diffusion of salt water up stream. On the Susquehanna it came up 30 miles and on the Potomac

16 miles. Certain water supplies in Maryland had to be discontinued on account of the salt content. In Pennsylvania the legislature made available \$50,000 for a complete study of this phenomenon, since it menaced the public water supplies of Chester and Philadelphia. The salt water invasion had a secondary effect, according to investigations by the Department of Zoölogy of the University of Maryland, their studies indicating that the high saline content in the Magothy and Severn Rivers was responsible for the very extensive death of fish.

Ground Water Lowered—Ground water supplies have been lowered throughout the drought area and no recovery has been made to date in 1931. Well and spring supplies will probably fail in sections of all 6 drought states during 1931, since the water table is several feet lower than at the corresponding time of 1930. This condition in West Virginia had developed increased mineralization in deep well supplies, and iron particularly is giving much trouble.

In Ohio the threatened lowering of ground water has been responsible for the action of the 1931 legislature in making available \$10,000 to drill and equip 65 wells in Southern Ohio to supply farmers and tourists with safe drinking water.

Typhoid and Intestinal Disorders—There was no large increase in typhoid fever in this area in 1930 such as was observed in the 1925 dry period. Possibly the wholesale typhoid immunization indulged in because citizens wished protection was one reason. Then too, state sanitary engineering divisions were unusually active in supervising the chlorination of emergency water supplies.

Stream pollution control work and its needs have been emphasized and the program may be expected to go ahead more speedily. Taste and odor control by treatment with ammonia-chlorine and activated carbon has received a strong stimulus and it appears likely that processes until now considered in the research stage will move rapidly to the field of practical application.

It has been reasonably well proved that too great an organic and putrefactive load of pollution on a raw water supply will bring about conditions which may cause intestinal disturbances among the users even though it meets the strict bacteriological qualifications for a safe public water supply.

The aggregate and final effect of the 1930 drought on public health will probably be beneficial. The general public have received a dramatic portrayal of the worth of safe, palatable, adequate public water supplies.

REFERENCES

1. Hoyt, Kendall. *Eng. News-Rec.*, June 4, 1931.
2. Goudey, R. F. *Eng. News-Rec.*, Mar. 12, 1931.

DISCUSSION

H. E. MOSES

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MR. TISDALE in his excellent paper has graphically portrayed the desperate condition in which public water works found themselves in the affected area. Merely to procure a water supply of any sort to replace or supplement those which had failed or dwindled to the vanishing point taxed the ingenuity and resources of the water works officials. Frequently, the ordinary supplies and the emergency ones were unpalatable. Conservation measures entailed rationing of the public supply in extreme cases.

As a consequence, the public resorted to the use of miscellaneous supplies secured where possible and without due regard to their safety. A serious health problem thus arose, entirely distinct from the necessity of rendering safe the public supplies.

In Pennsylvania, a measure designed to meet this condition was instituted by the Secretary of Health, who kept 5 mobile laboratories in the field from August, 1930, to September, 1931, except for the mid-winter months. From March, 1931, federal aid was given. Each unit was in charge of a sanitary engineer, the remaining personnel comprising a bacteriologist and laboratory helper and 3 health officers. The service was free to anyone desiring it. Work was principally confined to the rural areas, although upon occasion examination was made of public supplies, especially where emergencies occurred. At one place where the public supply was in serious trouble, the townspeople drove far from town to secure water and here nearly 800 samples were collected over a 20 mile area. At its conclusion this work had been carried on in 44 counties, and nearly 23,000 water supplies had been examined.

Perhaps the drought was needed as a lesson to the water works fraternity and public health engineer. We have become so accustomed to thinking with rather smug satisfaction that our water supplies in general are safe, adequate, and mostly palatable, that some sharp lesson is required to show the narrow margin which really exists between such a state and one where the ordinary routine is endangered and all the potentialities engendered by emergencies spring into being. That the affected area was not visited by a marked increase in water-borne disease is a gratifying commentary on the extreme care with which the safeguarding of the innumerable water supplies which had to be used was carried out, many times under adverse conditions.

New methods of treatment of water supplies for the control of odors and tastes probably advanced, under stress of immediate needs, far more rapidly than would ordinarily be expected. What usually would require months and perhaps years to accomplish has happened over night because of the urgent need of some means of producing water fit to drink. At the close of 1930, 17 water works in Pennsylvania had installed the ammonia-chlorine process, and other installations have since been made. Activated carbon has been tried out and in at least one instance adopted as a regular plant process when needed.

As the result of failure of impounded supplies, the water works engineer is asking the pertinent question as to whether we need to revise our present-day basic design figures as to storage.

Naturally where large impounded supplies were used there was a distinct lag in feeling the effects of the drought; this in distinction to the smaller supplies which were early in trouble. In Pennsylvania in the case of 2 large water works with immense storage reservoirs in use, serious trouble was not encountered until the end of 1930, whereas the smaller supplies were depleted in August. There is one instance of a 3 billion gallon reservoir drawn down to 19 per cent of its effective storage, and there are still other instances of where very large impounding reservoirs were practically emptied. Consequently, it is no wonder that the engineers of these water companies are giving consideration to the matter of the possible need of additional storage.

Pertinent to this subject is an article by Kendall K. Hoyt¹ where in a discussion of data compiled by the U. S. Geological Survey on the 1930-1931 drought he says:

Droughts Recur—Studies of past rainfall and stream-flow records show clearly that droughts are recurrent and that another drought of 1930 severity is almost mathematically certain to happen again. Notwithstanding opinions of old residents to the contrary, the 1930 drought was not unparalleled. It was the severest in 50 years of definite record, but three others during this same period were comparable in extent, rainfall deficiency, and attendant heat: those of 1881, 1894–1895 and 1910, fifteen years apart on the average. The 1930 drought, however, was of exceptional effect not only because of the economic depression but also because the demand and uses for water have increased since the drought of 1910.

Many interesting problems have arisen due to the adverse conditions, some of which have been mentioned by Mr. Tisdale. One that seems to have been rather general was the changes which occurred in the character of the water, particularly noticeable in Pennsylvania on the Allegheny and Monongahela Rivers. L. S. Morgan, District Engineer of the Pennsylvania Department of Health, stationed at Pittsburgh, describes some of the conditions prevalent at that time as follows:

The Monongahela receives considerable mine drainage and is usually acid down to Pittsburgh and the water plants along this stream have been accustomed to handling water of that type. However, this condition changed and while the river was highly acid to a point about 25 miles above its mouth, down stream from this point the acidity was gradually decreasing until it was actually alkaline near its mouth during the extreme low flow period. This gradual reduction was not due to the inflow of alkaline diluting water from tributaries, but was caused by neutralization of the acidity, principally at industrial plants, of large volumes of the river water and the return of this alkaline water to this stream.

The increased cost of treatment was a serious factor and was due principally to the amount of chemicals used. At one water works as much as 27 tons of soda ash and 12 tons of lime a day were required to soften 14 million gallons of water. Here the cost of chemicals alone for 1930 was more than double that for any previous year. This plant has constructed a carbonization plant and will utilize the carbon dioxide generated by burning natural gas. Other examples might be cited, but this one alone is significant of the changed conditions which had to be met by water works operators.

The failure of underground water supplies has directed attention as perhaps nothing before to ground water conditions. Seemingly definite information is hard to secure concerning the replenishment of underground supplies. The general impression seems to exist that wells and springs have not returned to normal and the statement has been made by John C. Hoyt, of the U. S. Geological Survey, that while the surface streams may be expected to be restored shortly, it is anticipated that a much longer time will be needed before the wells and springs come back to normal. It has been our observation in Pennsylvania, without making a definite and detailed study, that the underground supplies have not been replenished although they are not so seriously affected as during the 1930 drought.

One interesting case was noted which might have some significance. A limestone quarry was visited during August of this year. This has a depth of possibly 60 feet and when seen was quite dry. The department's engineer was told that this quarry had been dry for the last 18 months, whereas formerly it had been necessary to pump water at a rate at times as high as 500 gallons per minute.

It is not particularly relevant in this discussion to refer to other phases of the drought, such as the effect on crops, but because of the relation between forest cover and runoff, it is at least interesting to mention the effect which the drought had in the forests. One brief reference to this will serve to illustrate this phase of the

problem and is quoted from the *Service Letter*, Pennsylvania Department of Forests and Waters, April 16, 1931, as follows:

LOSS IN TREE GROWTH FROM THE 1930 DROUGHT

Measurements and observations taken on the Mont Alto and Michaux State Forests in Franklin County indicate that the tree growth of 1930 was 25 per cent less than that of 1929, as a result of the drought. White pine showed a loss in diameter growth of 28 per cent. Similar conditions were observed in the Rothrock District in Huntingdon County and in the Penn District in Mifflin and Centre Counties.

On the basis of an average growth of 40 cubic feet per acre per year, the 1,429,135 acres of State Forests suffered a loss of 14,290,000 cubic feet or 158,700 cords. On the basis of an average growth of 25 cubic feet per acre per year, the 13,206,000 acres of forest land in the State suffered a loss of 82,538,000 cubic feet. In addition, thousands of forest tree seedlings have died as the result of the drought.

REFERENCE

1. *Eng. News Rec.*, June 4, 1931.
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Who Are the Superior?

AT the same time that I do not consider the proofs of the inferiority of the rapidly reproducing groups satisfactory, I do not consider the proofs of the hereditary superiority of the socially successful satisfactory. Social success, in which I include economic success, is proof only of individual adaptation to the conditions necessary to secure the type of success which happens to be valued most highly by the group at a given time. It is not proof of an all-round ability in the person who succeeds, nor is it proof of the possession of qualities which will contribute largely to the development of a progressively improving society. As a matter of fact, many people who make a social success do so because they are thick-skinned and lack the imagination to see the ways in which their success will react adversely upon the welfare of others and upon the organization of community life. There is nothing inherent in the nature of social success to ensure that the person who attains it will also possess the finer human qualities which will add to the fullness and richness of our life.

It would not be at all difficult for any one who knows a number of successful people to pick out several of them, perhaps one-tenth to one-fourth, who owe their success largely to the qualities which they share in common with the bully, the prize fighter, the ward heeler, and the fox.—Warren S. Thompson, *Population Problems*, 1930, p. 355.

Sewage Disposal Difficulties Due to Drought*

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IN considering the difficulties occasioned by a drought, in relation to sewage disposal, one has an entirely different point of view from that of the water works man with a surface supply who is likewise in trouble from the same general cause. In a given situation there normally may be sufficient water in a stream to furnish an adequate water supply and also sufficient dilution for the sewage of the community as it is discharged to the stream, either with or without treatment. At times of low water stage, except when the raw water supply is affected by upstream sewage discharges, the difficulties in connection with the disposal of sewage will arise before a water shortage makes itself felt. In fact there may be serious difficulties in connection with the disposal of sewage with no shortage of water for water supply purposes.

On the surface at least, the effects of a drought, in a given case, may serve only to create conditions in a relatively unpolluted stream which are similar to grossly polluted conditions frequently occurring in a nearby stream. For that reason, a drought does not present the unusual circumstances in relation to sewage disposal that it does with respect to water supply.

In the drought area during the first season of the 1930-1931 drought, lack of normal surface run-off caused low stream stages. During the second season the stream flow stages were further affected by failure of the ground water resources which are normally available for maintaining minimum stream flows in the absence of surface run-off.

Table I taken from *Engineering News-Record*¹ indicates the degree of shortage during 1930 in certain major Ohio streams. Data presented on 5 West Virginia streams² indicated essentially the same stream flow conditions to be prevalent in that state.

It is obvious, if the flow in a stream is barely adequate under ordinary circumstances to furnish proper dilution for the sewage of a community, that if the flow falls to only 5 per cent of normal, for example,

* Read before the Public Health Engineering Section of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 15, 1931.

TABLE I

(ENR April 16, 1931)

FLOW IN CERTAIN OHIO STREAMS DURING DROUGHT

	Hocking River at Athens, O. 944 sq. mi.			Muskingum River at McConnelsville, O. 7,410 sq. mi.			Scioto River at Chillicothe, O. 3,850 sq. mi.		
	Actual Flow, Sec.-Ft.	Normal Flow, Sec.-Ft.	Per Cent	Actual Flow, Sec.-Ft.	Normal Flow, Sec.-Ft.	Per Cent	Actual Flow, Sec.-Ft.	Normal Flow, Sec.-Ft.	Per Cent
Oct., 1929	398	393	131	2,460	2,550	97	2,840	1,400	203
Nov., 1929	2,360	815	290	10,900	5,460	200	7,710	2,740	288
Dec., 1929	1,650	1,350	122	11,400	9,390	122	8,830	4,930	179
Jan., 1930	2,310	1,720	134	25,100	12,200	206	17,700	6,740	263
Feb., 1930	1,590	1,820	87	12,200	12,200	100	8,200	6,040	136
March, 1930	2,240	2,140	105	16,200	14,800	109	6,750	7,300	90
April, 1930	910	1,380	66	7,490	11,300	66	2,310	5,810	40
May, 1930	179	1,120	16	2,700	8,110	33	800	3,750	21
June, 1930	77.8	876	9	1,360	5,620	24	470	3,050	15
July, 1930	52.2	487	11	711	3,870	18	303	1,510	20
Aug., 1930	39.6	439	9	494	2,190	23	214	937	23
Sept., 1930	44.8	354	13	631	2,720	23	233	1,060	22
Oct., 1930	36.1	303	12	625	2,550	25	225	1,400	16
Nov., 1930	51.4	815	6	784	5,460	14	254	2,740	9.3
Dec., 1930	64.5	1,350	5	981	9,390	10	267	4,930	5.4

the otherwise relatively unpolluted stream will become grossly polluted.

Such conditions undoubtedly existed at many points in each of the states within the drought stricken area but with more serious effects in certain localities than others. An analysis of the effect of drought in relation to sewage disposal may indicate that under certain circumstances a drought may be helpful rather than detrimental to stream conditions. Further than that, circumstances so alter cases with respect to stream pollution problems that specific instances of exceptions to broad principles may always be found.

In the present discussion, no attempt will be made to describe specific instances of difficulties encountered except in cases where such an instance may serve as an example of the circumstances being outlined. Instead, the writer will present briefly the general circumstances under which difficulties occur, the broad effect of the difficulties, and the general remedial measures which would be helpful if they could be applied.

EFFECT ON SEWAGE DISPOSAL

Outside of those conditions common to all streams overloaded with sewage, the low river stages accompanying a drought are responsible in many cities for exposed sewer outlets with accompanying local nui-

sances. Under normal circumstances such conditions would not be tolerated, but under drought conditions which everyone feels may be terminated at any time they are allowed to continue.

Low stream stages also expose sludge deposits with attendant odors and unsightliness.

On the other hand, where cities have sewage treatment works drought conditions may be helpful so far as plant efficiencies are concerned. In the first place, the sewage becomes concentrated and, up to a certain point, more amenable to treatment. This concentration primarily results from lowering of ground water tables with consequent lessened infiltration into sewers. In communities where an acute water shortage exists the sewage is even further concentrated because of economy of water consumption. Increased plant efficiencies are also obtained in the case of works treating combined sewage because of less frequent disturbances due to storm water.

Sludge drying is also facilitated under drought conditions. In a properly designed and adequate plant this may not be a material factor but in cases where sludge digestion and drying capacities are inadequate the lengthened drying season may be exceedingly helpful. During the winter of 1930, the weather in Indiana was such that it was possible to dry sludge on open beds during the entire season.

EFFECT ON STREAM CONDITIONS

In first considering the result of low stream flows attendant upon a drought, it would not be expected that benefits would accrue because of the limited amount of water available for dilution. In general, however, stream conditions often are improved if the stream is considered as a whole.

In the first place, streams which in normal years may be deep, under drought conditions become shallow and partake of the more favorable self improvement characteristics of small streams. For a number of reasons small shallow streams correct polluttional conditions much more quickly than deeper ones. There is more opportunity for surface absorption of oxygen than in deeper ones, since in such streams the water is exposed to the air in thin sheets with the result that there is more exposed area in relation to the total volume of water. Under such circumstances the direct effect of the actinic rays of the sun is also more pronounced.

Under drought conditions stream turbidities usually are low since there are no rains sufficient to carry in surface wash. This latter circumstance occurs more readily after the drought has persisted for some time in that due to dry soil conditions very heavy rains often do

not cause turbid streams. Such low turbidities favor the prolific development of algae. Of particular interest in this connection is the prevalence of algae capable of photo-synthesis.

In certain shallow Indiana streams over 300 per cent saturation of dissolved oxygen has been found on sunny days. Certainly such conditions assist materially in improving stream conditions. Of course, in normal years excessive dissolved oxygen content may be expected on sunny days, but the ratio of bright to cloudy days certainly is increased under drought conditions. While, from the water purification man's point of view, such algal conditions are not considered an unmixed blessing, nevertheless on a stream not used as a source of water supply such conditions are helpful in enabling the stream to return more quickly to its natural condition after receiving a pollutorial load.

Diminished flows in many streams result in the formation of alternate pools and riffles, the pools affording opportunity for sedimentation and the riffles for surface absorption of oxygen. Again the formation of such pools may not be without its disadvantages since very offensive conditions with serious local odor nuisances may be produced by the decomposing sludge in them. Nevertheless if the whole stream is considered, in many cases conditions may be found to be better with the low flow. Even then the benefit of improved conditions may be lost if a sudden freshet quickly washes out the sludge which has accumulated in the pools over a period of months. Under such circumstances water supplies, not normally greatly affected by the discharge of sewage upstream, may be seriously jeopardized.

For the purpose of illustration, data secured during the course of a stream improvement survey of White River between Anderson and Muncie, Ind.,⁵ are presented in Table II. A review of these data indicates that the concentration of *B. Coli* at the Anderson intake was much lower during the summers of 1925 and 1930, both drought years, than during 1926, which more nearly represented normal conditions.

During drought years, due to diminished flows, less oxygen is available in the streams as they reach points of sewage discharge. This condition is further aggravated by the fact that the temperature of water in shallow streams may become extremely high, with consequent lowering of capacity for oxygen absorption. While there are no compensating factors for the oxygen deficit, nevertheless the smaller stream flow results in increased concentration of organic matter in the stream. As observed by Streeter⁶ and others, the rate of self purification of a stream is markedly accelerated in stretches where the concentration of organic material is highest. In other words, the rate of self improvement is proportional to the concentration of organic material.

TABLE II

B. Coli CONCENTRATION IN WHITE RIVER, MUNCIE TO ANDERSON

Period	Distance Below Muncie Intake Miles	Number of Days Sampled	B. Coli* per c.c.	Remarks
1925 July, Aug., Sept.	0 9 22	17	20 9,000 49	Extremely dry season with very low stream flow Anderson Intake
Oct., Nov., Dec.	0 9 22	10	10 1,000 275	Anderson Intake
1926 Jan., Feb., March	0 9 22	6	7 750 400	Anderson Intake
Apr., May, June	0 9 14 16 22	12	20 2,200 300 150 60	Anderson Intake
July, Aug., Sept.	0 9 14 16 22	11	31 3,000 300 325 90	Normal season Anderson Intake
1930 Sept., October	0 9 14 16 22	3 3 3 3 4	4 67,000 400 100 30	Extremely low stream flow under conditions of extreme drought Anderson Intake

* B. Coli Determinations 1925-1926 by Indianapolis Water Company—10 portions each dilution, parallel planting on Brilliant Green.
B. Coli Determinations 1930 by Indiana State Board of Health—1 portion each dilution, presumptive only.

In summarizing it may be said that even though theoretically there are advantages to be attained through low stream flows, predictions as to the actual occurrence of such benefits can be made only when certain definite circumstances are considered. This is the case since there may be improvements at one point on a stream, while at other points a corresponding increase of undesirable features may be noted. Perhaps the best example of what may happen due to diminished stream flow may be seen in the case of Charleston, W. Va.² This city is located at the confluence of Elk and Kanawha Rivers. The

Kanawha is the larger and is canalized. The water supply intake is located in Elk River at least $1\frac{1}{4}$ miles above the junction. Downstream from the intake on the Elk, the city is said to have maintained a garbage dump. The municipal sewers discharge into both the Kanawha and the Elk but none above the intake.

As the river flow diminished during the summer of 1930, due to the dams in the Kanawha, the Kanawha and lower Elk became one great septic pool. On July 24 the flow in the Elk became less than the draft placed upon the stream by the water works and consequently the water from the pool, containing the garbage dump and an accumulation of sewage, was drawn upstream to the intake. Very soon the dissolved oxygen of the raw water fell to zero and the 37° bacterial count rose to between 50,000 and 100,000 per c.c. with organisms of the *Coli-aerogenes* group demonstrated in 0.001 c.c. In addition other organic substances had built up to a concentration which made it impossible for the purification plant to produce palatable water although by careful treatment it was made safe—at least from a bacterial standpoint. The same general circumstances occurred at another major city in the drought area.

Low stream stages with consequent complications in relation to sewage disposal affect the general public welfare in many ways. Fish life is materially interfered with and in many cases is actually destroyed with attendant economic loss from the food standpoint to say nothing of the effect upon the activities of sportsmen. The use of streams for watering stock is materially interfered with. The water also is in some circumstances rendered unfit for industrial use. By the formation of pools with consequent accumulation of sludge, and in many other ways, drought conditions in streams result in extremely objectionable odors which materially injure the comfort of those living nearby. However the greatest detriment is the deleterious effect upon public health.

In the first place exposed sludge deposits and the like may result in an extreme fly nuisance. Milch cattle may wade in polluted streams and come out for milking with bits of scum and sludge adhering to the flanks and udders. If the cow is not prepared for milking with extreme care, this sewage material may find its way into the milk.

Of far more importance however are the difficulties experienced in connection with the operation of water purification plants. The outstanding example of such trouble occurred in connection with the Charleston, W. Va., water works. The circumstances there in the summer and fall of 1930 have been described but the direct effect upon plant operation was not touched upon. As has previously been indi-

cated it was possible to make the water safe from the bacterial standpoint by careful operation and heavy chlorination but nauseating tastes were experienced.

Prechlorination² at the rate of 4 p.p.m. assisted in reducing the bacterial load; copper sulphate applied every other day to the river reduced algal growths; aeration restored the dissolved oxygen to some extent but the resulting product was described as "vile." In further efforts to abate the tastes, superchlorination, pre-ammoniation, and the use of powdered activated carbon was practised with some alleviation but not correction of the tastes.

In spite of the fact that the water was demonstrated to have been bacterially safe, a city-wide outbreak of gastrointestinal troubles occurred. Inasmuch as the characteristics of the outbreak were typical of a water-borne epidemic, and the water was above suspicion from the bacterial standpoint, it was decided that the difficulty was probably of chemical origin and that the causative agent possibly was one or more of the end products of the excessive organic decomposition which had taken place in the water.

A similar outbreak occurred during the winter of 1930 in practically all cities taking water from Ohio River as far down stream as Louisville, Ky. In these cases the epidemic was usually city-wide and seemed to have been typical either of water-borne or so-called influenzal outbreaks. At the same time very objectionable "river tastes" were present in the water supplies drawn from this portion of the river. Conditions in Ohio River were somewhat similar to those experienced at Charleston in that the river is canalized and had been at pool stage for many months. While somewhat similar outbreaks of gastrointestinal disturbances were prevalent throughout the Ohio Valley, in cities drawing water from wells as well as from streams, M. V. Veldee, M.D., of the U. S. Public Health Service, made an epidemiological study of the outbreaks along Ohio and decided that they probably were water-borne, and possibly due to the heavy concentration of decomposing organic matter in the streams.

As in the case at Charleston, many different expedients were tried in an attempt to combat these tastes. Powdered activated carbon, pre-ammoniation, and other methods were employed at various plants with varying degrees of success.

While such tastes and odors of themselves probably have little direct effect upon public health unless they are associated with decomposition products capable of causing sickness, nevertheless, indirectly they may cause people to drink water from unknown sources which may be dangerous. Objectionable tastes may be attributed to the

use of chlorine, and for that reason in improperly controlled plants the use of the chemical might be discontinued or decreased in quantity, thus establishing conditions causative of water-borne disease.

Heavy burdens may also be placed upon purification plants because of a concentration of organic matter including bacteria. Such excessive concentrations may be caused directly by lack of dilution, or by a washout of organic material which has accumulated in the stream over many months. Back flow of sewage laden water in a manner similar to that at Charleston might quite easily cause a break in purification with attendant sickness.

Measures necessary to prevent such difficulties may be taken in relation to sewage treatment, water purification, or stream control.

In designing sewage treatment works liberal allowance should be made in the type and extent of treatment adopted in order to provide a margin of safety for unusual weather and stream conditions.

Treatment works should be carefully operated at all times but especially during low stream flows.

At such times under special circumstances the use of chlorine may afford some measure of relief, for reduction in biochemical oxygen demand results from sewage chlorination.

Chlorination of a sewage treatment plant effluent may also serve to delay decomposition in the receiving stream until a nearby tributary can supply diluting water. It may also serve to delay decomposition until critical down stream points have been passed.

The real solution to the problems discussed in this paper is more rain, or at least more water in our streams. In the present stage of our knowledge nothing can be done about the rainfall deficiencies but to a certain extent stream flow could be controlled. In this case the same remedy lies for increasing minimum flows as for controlling flood flows, namely, the construction of upstream storage reservoirs and the carrying out of reforestation programs wherever possible. If storage reservoirs were available flood flows could be decreased and minimum flows increased. The same results in a minor degree would be accomplished by reforestation.

Careful education of the public and officials by sanitary engineers and public health workers will be necessary before the latter expedients can be carried out.

REFERENCES

1. Anon. Field Notes on Water Supply Conditions in the Drought Regions, *Eng. News-Rec.*, 106: 16 (Apr. 16), 1931.
2. Anon. Field Notes on Water Supply Conditions in the Drought Regions, *Eng. News-Rec.*, 106: 14 (Apr. 2), 1931.
3. Report of Coöperative Sanitary Survey of White River, Unpublished. Department Sanitary Engineering, Indiana State Board of Health.
4. Streeter, H. W. The Effects of Sewage Discharge on Streams, Presented Pennsylvania Sewage Works Association (June 23-24), 1931.

An Epidemiological Study of Suspected Water-borne Gastroenteritis^{*}

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LATE in October, 1930, there developed among the inhabitants of Charleston, W. Va., an acute ailment involving the gastrointestinal tract. Without any prodromal symptoms the attacked individual suffered an acute disturbance in the alimentary canal, beginning usually as a sharp pain in the epigastrium with general abdominal discomfort, the severity varying a good deal with the individual. Nausea or vomiting or both soon followed. In the milder cases no further symptoms developed, though in the vast majority diarrhea ensued within a few hours. In the severe cases the diarrhea became an uncontrollable bowel action over a period of several hours. There were no known cases which developed bloody stools. The site of greatest irritation varied with the individual, so that in some vomiting was the most annoying symptom, in others abdominal cramps, and in yet others a diarrhea, while the more severe cases developed all the symptoms mentioned.

In relatively few instances was a physician consulted, so that clinical observations were limited. A few temperatures had been taken and these were practically normal in the robust adult, but usually slightly elevated in the aged, the enfeebled and in young children. One of the physicians interviewed had made one or two white counts and found them within the normal range.

The duration of the attacks rarely extended over three or four days, with the milder ones lasting only a few hours. With the subsidence of the symptoms the patient again felt entirely well, except for such general weakness as may follow the use of any strong purgative.

The writer investigated this outbreak on November 12 and 13 at which time very few new cases were developing. State health officials estimated that in Charleston's approximately 60,000 inhabitants there had been from 4,000 to 7,000 cases. There had been no deaths. A house-to-house inquiry was made of homes in two rather small areas of

^{*} Read before the Public Health Engineering Section of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 15, 1931.

the city; one being in an economically good section and the other in an economically poor section. The former reported 11.4 per cent of all persons canvassed as having been ill, while the economically poor section reported 18.7 per cent. This gives approximately 9,000 cases for the entire city.

No reports had come to the State Department of Health of cases occurring elsewhere in the state. The Kanawha County Health Officer had encountered no cases in that portion of the county beyond the city boundaries of Charleston. At the writer's request the County Health Officer talked over the telephone with practising physicians in those communities lying in the general vicinity of Charleston. Each physician stated that he had no such disease in his practice nor did he know of any in his community. Inquiry was made more particularly among those families living across the Kanawha River from Charleston. No cases had appeared among them.

The outbreak in Charleston soon abated and no further disturbance was encountered until near the first of January, when cases with exactly the same symptomatology began to appear in Huntington, W. Va., and Ashland, Ky. It was the opinion of the Health Officer and physicians of Ashland that the number of cases in that city began to decrease about January 10 so that at the time of the writer's visit on February 3 few if any cases remained. Many physicians in Ashland were interviewed and all gave the same clinical description which coincided with that already given for the Charleston cases.

Investigation revealed that residents of Ironton, O., had experienced the same ailment at approximately the same time as those of Ashland. Portsmouth, O., reported the same experience though apparently in a less severe form. Cases began to appear in Cincinnati about January 15 and rapidly increased in number, though it was apparent by February 1 that few new cases were developing. The exact number occurring in Cincinnati cannot be stated, as no systematic canvass was made and cases were not reported to the health department. However, in view of comments appearing in the press, conversations overheard in various meeting places, and the fact that personal conversations with many individuals in various economic positions revealed few who either had not suffered from the ailment themselves or had relatives or friends who had been afflicted, it must be concluded that a considerable percentage of the population was attacked, though it is believed this was not so great as in Charleston.

Complaints from Louisville, Ky., about January 25 indicated that that city was experiencing the same inconvenience.

A personal investigation was made in Hamilton, Dayton and Co-

lumbus, O., and Parkersburg, W. Va., without finding any evidence of a similar outbreak in these cities. Indirect information from Pomeroy, Marietta, Bellaire, Martin's Ferry and Steubenville, O., and Wheeling, W. Va., indicated that no cases had come to the attention of the officials in any of these cities. Similar information from a non-medical source was that cases were appearing in Sistersville, W. Va., about December 20, though this was not confirmed. The most striking illustration is that of Cincinnati and Norwood, O. The latter city, with a population of 33,000, is so situated as to be almost entirely surrounded by the city of Cincinnati. The available evidence indicated that numerous cases did occur in Cincinnati, but through a similar investigation in Norwood the writer was unable to find cases among that portion of the population which had had no direct contact with Cincinnati. A large portion of the working population of Norwood is employed in Cincinnati and among this group cases did occur.

Unfortunately a more detailed case investigation could not be made throughout the epidemic zone. Because of the relative mildness of the disease, cases were not referred to hospitals for treatment. For this same reason, and also because of the explosiveness of the outbreak, the physicians did not have time to make any clinical study of the cases. One visit to the physician or a request for advice over the telephone usually sufficed for the relatively small portion who sought medical attention. However the present epidemiological investigation was sufficiently detailed to outline the geographic distribution of the outbreak and provide evidence which appeared at that time to give a plausible explanation for the disease.

Approximately one-sixth of Charleston's population became ill in the brief period of 2 weeks. This indicates a rapid dissemination of the causative agent throughout the city, irrespective of economic, social or color barriers. The presence of so many cases within the city and the complete absence in the communities immediately surrounding further restricts the causative agent to some channel which did not extend beyond the city boundaries in the Charleston area; unless we are to assume that those persons living beyond the city possessed a peculiar immunity. However, the appearance approximately 2 months later in at least 6 Ohio River cities of an ailment which in all of its clinical manifestations corresponded with the Charleston cases makes it appear that the causative agent was contained in some vehicle which also was common to these latter cities, and further that this same vehicle was absent from the nearby cities of Norwood, Hamilton, Dayton, Columbus and Parkersburg. Immediately it is seen that any theory of an air-borne person to person route of infection becomes impossible.

Similarly milk and other foods are removed from suspicion. There remains but one possible avenue of communication which was common to all the inhabitants within any one individual affected city, at the same time common to all of the cities involved and not to those in which the outbreak failed to appear. This avenue of communication was the public water supply.

Charleston normally draws its water supply from the Elk River but for the period of the outbreak the water was largely from the Great Kanawha River. The Great Kanawha flows into the Ohio several miles above Huntington, W. Va. Aside from Charleston the only other cities known to have been involved in the outbreak use water from the Ohio, whereas cities located in the same general area but not using Ohio River water escaped. This even applied to Parkersburg, W. Va., which borders on the Ohio up-stream from the confluence with the Great Kanawha but which derives its drinking water from driven wells.

The natural assumption, therefore, is that the cause for this restricted epidemic was a bacterial infection of the gastrointestinal tract made possible by a let-down in the sanitary quality of the drinking water. However, there is no evidence to prove this.

TABLE I

THE MEAN MONTHLY *B. coli* INDICES PER 100 C.C. IN THE UNTREATED RAW WATER SUPPLIES OF CERTAIN CITIES LOCATED ON THE OHIO OR GREAT KANAWHA RIVER

Month	Ohio River								Kanawha River
	East Liver-pool	Steuben-ville	Wheel-ing	Ashland	Ironton	Ports-mouth	Cin-cinnati	Louis-ville	Charles-ton
<i>1930</i>									
January	15,254	1,505	970	10,800	5,500	4,710	1,348	2,742	1,139
February	8,614	2,170	1,900	13,850	7,600	5,130	1,096	1,900	575
March	2,422	143	1,500	15,500	9,000	4,680	1,320	565	1,232
April	2,703	129	440	10,900	2,600	4,300	454	172	1,296
May	146	586	120	21,600	4,100	8,196	216	257	3,435
June	778	216	390	17,500	7,600	9,100	88	139	9,370
July	10,423	1,362	6,600	15,800	4,000	4,970	111	166	8,748
August	10,091	23,350	8,800	7,400	12,400	2,538	13	240	8,258
September	2,035	20,000	9,700	10,600	7,480	3,766	25	208	144,400
October	24,656	2,110	7,100	28,900	15,000	3,967	13	137	84,435
November	10,882	10,540	9,400	42,800	2,700	6,766	6	154	2,726
December	32,064	15,000	10,000	2,985	2,800	4,100	12	21	2,945
<i>1931</i>									
January	13,036	262	3,700	23,600	6,200	4,600	165	32	1,374
February	34,750	1,810	4,700	19,300	3,000	2,507	733	180	2,117
March	22,745	1,220	2,600	6,230	4,160	2,654	910	251	2,216

Evidence as to the grossly polluted character of the waters of the Great Kanawha and the Ohio Rivers (Table I) need scarcely be given. The laboratory reports from each city show that the raw untreated waters were of their usual poor quality which from past experience are known to be capable of causing enteric diseases in the water drinking population, provided the safeguard of modern water purification is removed. No such break in the purification processes occurred at any time, as is shown by the *B. coli* indices of the treated effluent waters (Table II). The indices are without exception as favorable for the period of the outbreak as they have been for the corresponding months of other years. In addition this outbreak of acute gastroenteritis was not followed by an increase in the prevalence of typhoid fever, an occurrence which past experience has shown would surely follow the drinking of inadequately treated Ohio River water.

TABLE II

THE MONTHLY MEAN *B. coli* INDICES PER 100 C.C. IN THE TREATED EFFLUENT WATER FROM THE WATER PURIFICATION PLANTS OF CERTAIN CITIES LOCATED ON THE OHIO OR GREAT KANAWHA RIVER

Month	Ohio River								Kanawha River
	East Liverpool	Steubenville	Wheeling	Ashland	Iron-ton	Portsmouth	Cincinnati	Louisville	Charleston
1930									
January	0.06	0.00	0.00	0.00	0.06	0.00	0.06	0.00	0.00
February	0.00	0.19	0.00	0.00	0.25	0.00	0.11	0.00	0.00
March	0.00	0.00	0.00	0.00	0.06	0.00	0.00	0.00	0.00
April	0.00	0.00	0.40	0.00	0.04	0.07	0.00	0.00	0.00
May	0.00	0.00	0.00	0.00	0.06	0.00	0.13	0.00	0.00
June	0.00	0.00	0.00	0.00	0.20	0.13	0.00	0.00	0.00
July	0.00	0.40	0.50	0.00	0.26	0.00	0.23	0.00	0.00
August	0.00	0.91	0.60	0.00	0.32	0.00	0.00	0.00	0.00
September	0.00	0.10	0.00	0.00	0.33	0.00	0.33	0.00	0.00
October	0.00	0.00	0.00	0.00	0.32	0.00	0.00	0.00	0.00
November	0.00	0.00	0.00	0.00	0.07	0.00	0.00	0.00	0.00
December	0.00	0.00	1.40	0.00	0.06	0.00	0.00	0.00	0.00
1931									
January	0.00	0.07	0.30	0.13	0.00	0.13	0.16	0.00	0.00
February	0.00	0.08	0.00	0.00	0.00	0.00	0.18	0.00	0.00
March	0.00	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.00

One of two groups of organisms is commonly associated with epidemics of gastroenteritis having an infectious etiology—(1) Infection with an organism of the bacillary dysentery group. This is commonly spread through the water supply. (2) Infection with one of the group

of organisms commonly associated with outbreaks of so-called food poisoning. These organisms are rarely if ever spread through the public water.

The outbreak which we have under consideration does not give the usually severe clinical picture of an infection with a bacillus of the dysentery group. The mild clinical manifestations more closely fit the clinical syndrome associated with food poisoning, but we are here confronted with the fact that the epidemic most surely was water-borne and appeared successively in at least 6 widely separated cities with a common water supply; whereas other neighboring cities with similar environments, except for the water supply, escaped.

Let us accept as a fact for the time being that the epidemic was a water-borne infection with one of the organisms mentioned. Then it becomes necessary to assume that this organism could appear in the public drinking water in sufficiently large numbers to cause such an explosive and widespread outbreak without there being a corresponding increase in the *B. coli* index; or we are forced to assume that these organisms are capable of resisting the various processes of modern water purification to an even greater extent than does the *B. coli* organism. Such reasoning does not seem plausible.

The circumstances at Charleston point even more strongly to a form of chemical gastrointestinal irritant than is the case in the other cities. The city water supply is normally drawn from the Elk River at a point in the Elk River Pool, $1\frac{1}{4}$ miles above the confluence with the Great Kanawha River. Due to the widespread absence of rain in 1930, flow in the Elk River gradually diminished until by late October it had practically ceased. Consequently there was a reversal of flow in the river below the water works intake so that the nearly stagnant water from the lower end of the pool and from the Great Kanawha entered the intake at the filter plant. This water was heavily charged with domestic sewage, soluble wastes from the city garbage dump, a variety of industrial wastes, the dissolved products from a heavy sludge layer on the bottom of the lower pool representing the sludge accumulation of years, and with a heavy growth of algae. Actual septic conditions prevailed in the Elk from the intake down to the Kanawha. This new water was entirely depleted of dissolved oxygen and showed *B. coli* present in 0.0001 c.c.

In spite of heroic water purification methods, which did succeed in producing an effluent free from turbidity and *B. coli*, the water received by the public still possessed the same nauseating odor and taste as was present in the raw water. The odor was similar to that escaping from an active septic tank. The taste was exceedingly offensive.

Both odor and taste were removed by boiling for a few minutes. The taste and odor became so disagreeable late in October and the first few days of November that the public practically refused to use the tap water for drinking purposes. The survey which the writer made on November 12 and 13 showed that in the families where sickness had occurred 80 per cent at the onset of illness were drinking the water as it came from the faucet, whereas in families where sickness had not occurred only 9 per cent stated they used such water, 41 per cent used boiled city water and the other 50 per cent obtained water from private sources. The fact that boiling the drinking water prevented the illness suggests that the cause might be a viable organism. However, the treated effluent consistently failed to show *B. coli* in five 10 c.c. portions, a fact which has always indicated a bacteriologically safe drinking water (Table III).

TABLE III
THE DAILY *B. coli* INDICES PER 100 C.C. IN CHARLESTON'S RAW AND TREATED PUBLIC WATER SUPPLY
FOR OCTOBER AND NOVEMBER, 1930, DURING A PART OF WHICH TIME THE CITY WAS VISITED
BY A WIDESPREAD OUTBREAK OF ACUTE GASTROENTERITIS

Day	Raw Water	Effluent Water	Day	Raw Water	Effluent Water
October			November		
1	10,000	0.0	1	100	0.0
2	10,000	0.0	2	1,000	0.0
3	1,000	0.0	3	100	0.0
4	1,000	0.0	4	1,000	0.0
5	10,000	0.0	5	100	0.0
6	10,000	0.0	6	100	0.0
7	100	0.0	7	1,000	0.0
8	10,000	0.0	8	100	0.0
9	1,000	0.0	9	1,000	0.0
10	10,000	0.0	10	1,000	0.0
11	100	0.0	11	1,000	0.0
12	100,000	0.0	12	0	0.0
13	10,000	0.0	13	1,000	0.0
14	100,000	0.0	14	1,000	0.0
15	100,000	0.0	15	0	0.0
16	10,000	0.0	16	10,000	0.0
17	100	0.0	17	10,000	0.0
18	100,000	0.0	18	10,000	0.0
19	1,000	0.0	19	1,000	0.0
20	1,000	0.0	20	0	0.0
21	1,000	0.0	21	100	0.0
22	0	0.0	22	10,000	0.0
23	100	0.0	23	0	0.0
24	100,000	0.0	24	10,000	0.0
25	1,000	0.0	25	100	0.0
26	10,000	0.0	26	10,000	0.0
27	10,000	0.0	27	1,000	0.0
28	10,000	0.0	28	100	0.0
29	1,000,000	0.0	29	1,000	0.0
30	1,000,000	0.0	30	10,000	0.0
31	100	0.0			

A series of events took place which may have some bearing on the outbreaks in the Ohio River cities. During the first week in November numerous dead fish appeared in the Great Kanawha opposite Charleston. Rain fell on the watershed of the Elk and Kanawha Rivers in December. Toward the end of December vast numbers of small fish died in the Kanawha, appearing particularly numerous 43 miles below Charleston. The dams on the Kanawha were lowered about January 1, the river having received enough run-off from the watershed to permit a good flush-out of the pools which had been accumulating wastes over a period of months. The men operating the dams complained particularly of the foul odors of decomposition coming from this released water with its accumulation of wastes. It is reported that numerous dead fish appeared in the Ohio River at Huntington and Ashland coincident with the appearance of illness in the inhabitants.

The prolonged absence of rain over the watershed of the Ohio and its tributaries caused a low water stage of unprecedented proportions. The dams were put in place on the Ohio early in May, 1930, and were still required at the time of the outbreak, thus establishing a series of pools into which only a small amount of diluent was added and in which there was only a sluggish flow. At the same time the volume of domestic and industrial wastes added to the river did not diminish. Because of the sluggish flow undoubtedly much of the undissolved wastes settled to the bottom, thereby building up sludge beds which under normal conditions would not have been possible. What new products of biological and chemical action were produced under such circumstances are unknown. Likewise the toxic action of sludge bed cleavage products has probably never before been tested on man on such a wide scale as took place at Charleston, and in a more dilute form in the Ohio River cities.

Tastes of a mild character do occur in the drinking water of all Ohio River cities from time to time, though never to such a degree as occurred in Charleston in early November. The presence of tastes and odors identical with those at Charleston, though less intense, appeared in the drinking water of each affected Ohio River city, being most intense during the period of the epidemic. This taste was not phenolic, but is better described as musty, decay-like, woody or mouldy. The odor from the hot water faucet was particularly musty. The taste at Louisville is described as distinctly strong and musty, which did not appear in the effluent water until the middle of January. This date coincides with the appearance of the illness in that city.

There is also a certain chronology in the appearance of the out-

break in each successive, down stream city. In Charleston it began about the last week in October and ended by November 10. Cases began in Huntington and Ashland on, or very near, January 1 and by the 10th a definite decline was taking place. Reports of cases in Cincinnati did not appear until about January 15 and it was not until after the 20th that the peak was reached. The peak at Louisville was apparently reached somewhat later than in Cincinnati.

Therefore, if we have correctly presented the epidemiological evidence in this series of outbreaks of gastroenteritis, the evidence is rather conclusive that the causative agent was transmitted by the public water supply which in the involved cities came from a common source. There is no epidemiological evidence to show that the ailment was produced by a viable organism contained in the water supply, unless we are to assume the sudden appearance of some bacterium or virus whose presence was not indicated by the established methods of water analysis. A series of stool cultures and serological examinations of many patients are also needed for a final answer.

The evidence strongly suggests that the acute gastrointestinal symptoms were brought about by the presence in the water of some chemical irritant whose physiological action simulated a strong purgative. The evidence does not show whether this chemical irritant was a cleavage product of bacterial action, a new chemical produced by bacterial synthesis, or the result of increased chemical concentration in the water brought about by a decrease in the diluent. There is at least a slight suggestion from the evidence that the toxic substance originated in the Great Kanawha River and was released into the Ohio when the dams were lowered on the Great Kanawha late in December, thereby releasing the pent-up wastes in a concentrated form which affected the public supply of each city as it moved down stream.

Raw or Pasteurized Milk

IN the extensive Lanarkshire milk experiment its authors concluded that "in so far as the conditions of this investigation are concerned, the effects of raw and pasteurized milk on growth in weight and height are, so far as we can judge, equal." The author of this article has rearranged the figures under the three groups 5, 6 and 7 yrs.; 8 and 9; 10 and 11, taking boys and girls separately, and produces tables which show a slight but distinct superiority on the basis of weight and height of raw over pasteurized milk. For all the children grouped together the advantage of raw milk for growth in weight is 0.86 ± 0.42 and for height 0.345 ± 0.006 . The actual differences are admittedly small, but the experiment only lasted for 4 months.—W. G. Savage, *Bull. Hyg.*, Aug., 1931, p. 639.

What a Public Health Nurse Expects of Her Chief—the Health Officer^{*}

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THE relationship between the health officer and the public health nurse is considered as that between an administrator and an executive. As a basis for discussion I have selected the functions for these two positions as outlined by Schell: ¹

The administrator determines policy. His major function is to represent equally the rights of the owners, the employees, and the public, a responsibility which has come more and more into his hands with the constantly rising status of management as a profession, and the waning influence of the board of directors as an administrative force in business operation. He guides and controls the progress of the enterprise in its fight for existence and advancement. He decides what shall be done and, in large measure, his success lies in the quality of business judgment shown in these decisions. He coördinates and keeps in proper balance all of the factors of the enterprise which are necessary to success. Having provided the agencies and paths of action, he delegates the action to others. He holds the executive responsible for the work itself.

An executive is one who is responsible for the execution of work performed by others. We look to him for accomplishment. We find him near the cutting edges of our industrial organizations where the main object is being approached. He is always close to the zone of action. Whether he be office manager in charge of clerks, district sales manager in charge of salesmen, or foreman in charge of workmen, his place is at the firing line. We may define the executive in still another way. He is the medium for the flow of orders and policies from the administrators to the employees.

The functions as outlined indicate definite fields, adequate preparation, and, I believe, mutual respect for each other's ability. The administrator has a slight advantage in that he has often selected the executive.

What then as public health nurses would we suggest to the health officer as standards for this selection? The National Organization for Public Health Nursing² presents minimum standards to succeed those

^{*} Read before the Health Officers Section of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 14, 1931.

offered at Boston in 1925 by the Nursing Section of the American Public Health Association and endorsed by the State and Provincial Health Officers, the Red Cross, and National Organization for Public Health Nursing. These standards in both instances were progressive for a period of 5 years and cover positions for staff nurse, supervisor and director.

I am sure we agree that education and experience are not enough, but they do make more effective the native ability of the individual. Pasteur said: "chance favors the mind prepared." Elimination of politics and improvement in the selection of personnel are the foundation of an efficient service. I cannot refrain from alluding to one of the replies to my request for advice on the content of this paper. It refers to the nurse applicant "who cannot forget her womanly charms long enough to get her work done. She is the person always recommended by a long list of gentlemen, often doctors, and sent to you with a letter from the man friend of Mr. Blank of the City Council—if no letter, he accompanies her personally and although 'only a friend' does all of her talking for her. You know her I'm sure." How well we all know her! A weakness for attractive women, however, is not limited to city fathers or health officers. A professor of home economics recently told me she had the greatest difficulty in placing her most capable but unattractive student because school superintendents preferred the pretty ones. I need hardly add that in a well organized service the executive nurse should have the privilege of recommending applicants, based on investigation and a personal interview.

What Does the Health Officer Expect of the Public Health Nurse?

To reduce the executive functions to practical public health organization—just what does a health officer expect of a public health nurse? First, I should say he expects her to execute the job, that is, to make possible expert nursing service in the one or more fields to which the service is committed. She is able to do this only when she has the authority to develop her program to conform to the best practices as outlined by such agencies as the National Organization for Public Health Nursing and American Public Health Association. Space permits only the mention of a few of the points they cover, such as procedures and technics, qualifications, supervision, staff education, salary, hours on duty, sick leave, and vacations.

The second thing a health officer should expect from the public health nurse is that he be kept informed on the service. Monthly reports of work performed are important, but they must be supplemented with thoughtful analysis and human interest. She, probably

more than any other person, has an opportunity to know the public's mind on the entire department program; yes, I might even say, to know what the medical profession thinks. She daily experiences the satisfaction of seeing the changing attitude toward confidence and respect for a modern health service, and too frequently hears the criticisms of the doctors because they do not know what it is all about. She should furnish opportune subject matter for education and publicity.

The third point might be included in the second, but for emphasis it has its place. Being close to the "firing line" she is able to observe community developments for new or coöperative services. In these days of reduced budgets there should be no duplication of work but a conscientious desire to carry on those services which officially belong to us. Dr. Ray Lyman Wilbur, Chairman of the White House Conference, in closing the second Conference, urged that all those present study the reports presented in relation to their own community needs and then make the application of the recommendations that fitted their situation.

Two instances of duplication in community service may be mentioned. In one, a preventorium maintained a field nurse to investigate applicants and follow up discharged cases. The official nurses were making regular visits in these same homes for infant, preschool, or school children, and in many instances had previously known the individual children. By transferring the field work to the official agency the preventorium was able to secure a much needed dietitian. In the other instance the city welfare department was sending an investigator into homes where a hospital order was requested by the prenatal clinic. This practice was discontinued when the nurse secured the data required for the records, which were practically those necessary to determine eligibility for clinic service.

Most men appreciate healthy, happy and contented women; so this is the fourth point a health officer expects. Probably no other time offers the same opportunity of selecting and maintaining a capable staff as the probationary period. This is the time to determine fitness for the job, for it is a difficult thing to eliminate the nurse unsuited to public health once she has received a permanent appointment. The consideration of the health of the staff is an important item—the nurse should exemplify the message she carries to the public. The things that make for a contented staff are a thorough introduction to the service with written policies or procedures for frequent reference, regular hours, a satisfactory salary, opportunity for promotion—in fact, those things which contribute toward a sense of fair

dealing and security in the job. I know a staff who although they failed to secure their automatic increases the past year willingly contributed a dollar a month per capita in addition to their annual pledge to the Community Chest during the winter months.

Every health officer sees his organization as a growing concern, which usually means increased personnel; this is especially true of the nursing service. He, therefore, looks to his directing nurse to recognize and develop those special abilities which make for leadership to meet a growing program. Staff education has come to be a recognized and legitimate expense of time and is compensated for in the interest and efficiency of the service rendered. Dr. Elliott Dunlap Smith of Yale has said: "Education is to create a thirst for knowledge, not to satisfy it—we must look on method as a growing thing which gives capacity to understand and reacts to enrich life." Public health nursing offers the most satisfactory laboratory experience. No two situations are alike, and the diversification of its application would indicate, through its growing demand, its success. These, then, represent what the writer believes a health officer expects of a public health nurse.

What Does a Public Health Nurse Expect of Her Chief, the Health Officer?

The first and most important factor is a definite, preferably written, purpose and policy of the organization service. Frequent changes are inevitable to meet the advancement in the growing field of public health. If the service is new and the budget is small, they should not be outlined to accomplish the millennium, so that the nurse is discouraged in attempting the impossible. Satisfaction in one's work is the best taskmaster. If too much is outlined the task is never completed.

Education of the community through publicity for a new project is an important step and saves endless explanations on the part of the nurse. This plan was most successfully carried out in Detroit in its Diphtheria Immunization Campaign last fall, before some 98 nurses were put in the field, and finally secured 73.3 per cent immunization of children between the ages of 6 months and 10 years.

The second point in importance is frequent opportunity for advice and discussion of developments, especially problems. In large departments with a full-time health officer and bureau chiefs, new projects are usually discussed in the commissioner's staff conference, giving the nursing executive an opportunity to register her opinion as to the feasibility of projects in relation to her field. Too often though, with

a part-time health officer, the program is outlined to the last detail without consulting the public health nurse on whom responsibility may fall for its execution. This, and a failure of his recognition before the nurses of the important part they play, and his acknowledgment of it before the rest of his department, dampen the enthusiasm and lower the morale of even the most capable staff. On the other hand, there are commissioners who never miss an opportunity to commend the staff as a whole, or individual members, when outstanding service is brought to their attention. Constructive criticism is equally welcomed when mistakes occur.

It is also important in a large organization that opportunity be offered by bureau chiefs for frequent conferences on procedure if the service involves clinic or field service supplied by part-time physicians followed up by public health nurses. Frequently the most skilled technic developed by a nursing service is entirely nullified by a hurried and indifferent part-time physician. I have seen the most carefully worked out technic for the administration of diphtheria immunization become a dangerous and confused procedure because a physician, arriving an hour late, was determined to jam his morning's work into the remaining time, and the entire protective measures built up by a conscientious nurse on a communicable disease case destroyed by a doctor sitting on the bed taking the temperature of a scarlet fever patient without cleansing his thermometer before or after using.

The third point has to do with the growth and development of the nursing service. We believe that nurses know and understand nurses, and that the method of approach to certain situations is to a degree intuitive. If, therefore, in complete understanding based on belief and respect for ability, the health officer permits experimentation in the development of a service, personnel, or what-not, he stimulates a unique and progressive service. This experimentation may involve such minor points as changing nurses' districts, rotating supervisors, change of hours, but maintaining the work day, etc.; or it may involve the entire program of the nursing service, as generalizing 2, 3 or any combination of services.

Public health nursing has arrived at its present stage of development through experimentation on the part of the private nursing agencies, but because of the difference in organization and administration we need experimentation in official organizations, such as that made possible in the 3 demonstration areas in New York through the Milbank Fund, and other notable demonstrations. It has been my privilege to have had a part in one of these developments and to have seen the interest and appreciation of a large number of American and

foreign visitors who observed the work. *Public Health Nursing* carries the "good news that the Commonwealth Fund has granted the National Organization for Public Health Nursing \$25,000 to finance a study of the present administration and practice of public health nursing. The study will cover both rural and urban services under official and unofficial administration in different sections of the country."

The fourth factor a public health nurse appreciates is an opportunity for advancement. Even resourceful people need recharging. The cheapest method is reading one's professional publications; the next, attending such meetings as this of the A. P. H. A., or other national health conventions, where one meets and hears leaders in the field. But to me the opportunity of the observation visit to an organization giving a good service in the field to be developed surpasses the chance discussion of a convention. The National Organization for Public Health Nursing is prepared to advise on where to observe outstanding work in the various fields of public health nursing.

Perhaps the most difficult method in official organizations for professional advancement, but the one which gives the greatest stimulation, is the leave of absence for study. Here you have all methods at your command, reading, hearing and meeting authorities in all fields, and contact with those of like purpose. I have had an interesting experience in observing the comparative value of the above opportunities, and believe there is a special value and even a proper sequence. A nurse who does not read her professional magazine has not much ambition or foundation to build on. However, with capacity to appreciate, the convention thrills and stimulates her to read more widely; the observation visit contributes new ideas, strengthens confidence in her own organization, and helps her to realize that all have problems; while study gives not only new knowledge and skill in her own field but opens up comparable fields and widens the chance of new and efficient application. These opportunities, however, are limited and should be given only to capable and ambitious nurses.

A continuous systematic and well planned staff educational program should be maintained to keep the entire staff in line with modern public health developments. In one community this program is planned by the directors of the visiting nurse, school, and health department services as a joint project for their three staffs. Much of the program the past year was presented by the county medical society. It has been estimated by various health authorities that one-third to one-half of the annual budget of the health department should be expended in nursing service. If this estimate is correct, the nursing

service deserves the same recognition as other services by making it a separate bureau headed by its own chief and operating with its own budget. Opportunity for approval by the executive nurse of all publications, publicity and questionnaires relating to the nursing service would also be appreciated, and in return any requests from her should be approved by the administrator.

One of the best means of securing interest in and recognition for a nursing service is through a lay advisory committee, well versed in the program. Volunteer service also offers opportunity for community understanding. The child welfare committee of a local Federation of Women's Clubs recently asked a department of health for the privilege of assisting in the child welfare clinic service. The request was gladly granted and 8 women, each representing a separate club, were instructed in their duties for clinic service. It would be hard to estimate the far reaching influence that these volunteers contribute to this particular service.

The sixth and last point deals with a personal quality and one that is hard to develop if it has not been a growing attitude. I refer to tolerance, "a recognition of the right of private judgment." Schell speaks of judgment as the "area of discretion." If this area is vague and the public health nurse is at a loss to know how far she may rightfully go, with a tolerant chief she will assist in defining the boundaries through the experiences of the work, for she must know her authority and responsibility to administer the service effectively.

I quote two valuable suggestions for coöperative participation in any field of endeavor: "Individually none of us is as good as he expects other people to be for whom he likes to set standards"; and "Acquire the habit of rating people not by the few things which attract or repel you, but by the general make-up, not just seeing people, but seeing into people."

REFERENCES

1. Schell, E. H. *Technique of Executive Control*, 1926, pp. 4-5.
2. Minimum Qualifications for those appointed to Positions in Public Health Nursing, *Pub. Health Nurs.*, May, 1931, pp. 230-231.
3. Cottrell, A. P. A Diphtheria Prevention Program, *Pub. Health Nurs.*, June, 1931, pp. 282-284.
4. Good News. *Pub. Health Nurs.*, Aug., 1931, p. 399.
5. Dow, Charles R. *Foundations of Human Engineering*.

NOTE: In order more completely to represent the public health nurse profession in the discussion of what she expects of her chief, the health officer, the writer solicited suggestions from official directors in various parts of the country. Gratitude is also expressed to the 7 health officers it has been her privilege to serve, who unwittingly have contributed to a long and varied experience.

Wyatt Galt Johnston*

THE American Public Health Association at the first meeting held in Montreal for 37 years deems it a privilege, through the authority of its President, Surgeon General Hugh S. Cumming, of the U. S. Public Health Service, and its Governing Council, to do honor to one of its most distinguished members who passed away all too soon.

Wyatt Galt Johnston, M.D., Professor of Hygiene at McGill University in 1902, was the son of a doctor in Sherbrooke, in the Province of Quebec. He received his early education at Bishop's College, Lennoxville, and subsequently was graduated from the Faculty of Medicine of McGill University in 1884.

As an undergraduate, his interest in pathology brought him into close association with Osler. Following upon his graduation, he worked under Virchow in Berlin, returning to Montreal to be appointed a demonstrator in pathology at McGill.

Later, at the Montreal General Hospital, he devoted himself to the subjects of pathology and bacteriology, and soon became actively interested in medico legal work. His command of these subjects was speedily recognized both by his university and by the bureau of health in the province. Not only was he appointed a lecturer in bacteriology at McGill University, but the Provincial Bureau of Health of Quebec named him as Bacteriologist, and he was made Coroner's Physician for the District of Montreal.

Within ten years of his graduation, he was a leading authority on the subject of medical jurisprudence and a pioneer in the teaching of this branch of work.

Few men of his time in Canada contributed so much and such valuable research in the field of public health. Among his more important contributions may be mentioned "A new method for the culture of diphtheria bacilli on hard-boiled eggs"—a practical method of rapid diagnosis for the determination of diphtheria. It was in this connection too that in 1892 he introduced the use of sterilized swabs in test tubes for the taking of cultures. Writing that year, Dr. Johnston spoke as a prophet when he condemned "the practice of withholding antitoxin until the diagnosis of diphtheria is clear," adding that

* Remarks at the Grave of Dr. Johnston by the Chairman of a Committee appointed by the President of the American Public Health Association, during the Sixtieth Annual Meeting at Montreal, September 14, 1931.

"probably a large proportion of the deaths from diphtheria arose from delay in the use of this remedy. One would think it better that the remedy should be given 99 times to persons not having diphtheria than to omit it in 1 genuine case." Surely the prompt giving of diphtheria antitoxin was never more strongly urged, and this too at a time when its value and harmlessness were still matters of doubt.

The value of the bacteriological diagnosis of leprosy received Dr. Johnston's attention, and he urged its practice.

A biological analysis of Montreal's water supply led him to recommend regular and frequent examinations, for which he devised a method of collecting water samples at various depths—a distinct and practical contribution to public health work.

Dr. Johnston's memory has a particularly happy connection with the American Public Health Association, for it was at the Buffalo meeting in 1896 that he presented his paper, "On the Application of the Serum Diagnosis of Typhoid Fever to the Requirements of Public Health Laboratories." His work was synchronous with that of Widal, although in the matter of priority of publication, Widal was the more fortunate. It was to Dr. Johnston, however, in these early years, that we were indebted for a very practical method of applying the Widal reaction for typhoid fever. In his communication, he says: "Instead of taking the serum as soon as it exuded, I allowed the drop to dry on pieces of paper, and found that, upon moistening it, subsequently, the solution obtained was just as efficacious as the pure serum for the purpose of the test." Its use became widespread and enabled the easy transmission, by post, from afar, of blood specimens to his laboratories, to the great satisfaction of rural practitioners.

When in 1902 (the year of his death) he became Professor of Hygiene at McGill University, he had attained the summit of his career as bacteriologist, pathologist, and expert on public health, while at the same time he was the accepted authority in the field of medical jurisprudence. To quote from Professor Welsh, "He was the outstanding authority in America," while as an original thinker his researches were conspicuous by their brilliancy and their integrity.

Most of all, Johnston is remembered by his contemporaries for his lovable disposition, his brilliant humor and his manly qualities.

This simple record of the man's life reflects, in some degree, his qualities and his character, but the lasting quality of his work and the survival of his personality depended still more upon the vision and nobility of character of the man himself. It was his rare nature that gave his life's work its peculiar significance, and this was appreciated even more deeply by the members of his profession and his many

friends. Love of truth, sincerity of purpose, and human understanding were among the guiding principles of his very existence.

A wreath furnished by the Association was then laid upon the tomb by Dr. C. L. Martin, Dean of the Medical Department of McGill University, an associate of Dr. Johnston.

The brief ceremonies were attended by Mrs. Johnston, her son, and a number of Dr. Johnston's old associates and friends.

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Portugal Kindergarten in Children's Hospital

IN Lisbon, Portugal, one of the hospitals has had for some time a combination kindergarten-elementary school for children 3 to 10 years old confined to the hospital. Most of these children are suffering from protracted chronic diseases, such as tuberculosis of the bones or rickets; they are kept away from school for a long time, in some cases for years.

The school, which was established through the efforts of one of the physicians, is maintained by private contributions. The Government has accorded it the standing of a public school, and it is staffed by two teachers, who are normal school graduates.

In addition to suitable theoretical instruction, the children are taught manual work, singing, and drawing. The children participated in a recent international drawing contest. Motion pictures and other entertainments are also provided. It is reported that the children are much happier since the establishment of the school.—*Difesa Sociale*, Rome, May, 1931, p. 238.

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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ENNION GIFFORD WILLIAMS

1874-1931

COMMISSIONER OF HEALTH OF VIRGINIA, 1908-1931

A LIFE of devotion to the cause of public health ended with the passing of Ennion Williams on June 6, 1931. As a boy of 18 he had confessed a wish to devote himself to the nascent science of preventive medicine. A study period in Germany under Connheim and Pettenkofer fixed his determination. He taught bacteriology and preventive medicine while establishing himself in Richmond in the new specialty of roentgenology.

As a successful practitioner he entered public life for the sole purpose of securing a betterment in the health service of his city. At 34 he gave up his practice to become Virginia's first Commissioner of Health. For 23 years he lived and dreamed and worked and fought for the health of his state. He became more powerful than governors and bosses, because all knew that he wanted nothing for himself but everything for his work. He was a kind man, but he could be hard when his work needed it. He was a gentle man, but he could fight like a tiger when his work was attacked. He was a generous man, careless of his own means, but he grudged every penny that was not productive of better health. He worked too hard, he died too young; but he worked for a purpose and he achieved that purpose, and all Virginia mourned his passing.

THE HEALTH OFFICER OF SAN FRANCISCO

THE appointment of Jacob C. Geiger, M.D., by the San Francisco Board of Health and Mayor Angelo J. Rossi, as Health Officer for the City and County of San Francisco, to succeed the late William C. Hassler, M.D., is an event of more than usual importance from the standpoint of public health. The Mayor has followed the lead of Governor Pollard, of Virginia, and Governor Roosevelt, of New York State, in selecting a health officer on merit, regardless of political considerations.

Following Dr. Hassler's death, the Mayor sent a memorandum to the Board of Health stating that political affiliations and party lines should be laid aside in the search for a suitable successor. He pointed out that Dr. Hassler had served 31 years in the Health Department, 15 of which were as City Health Officer, and that his efforts had resulted in the development of a department of unusually high standards. He felt that the board owed it to Dr. Hassler's memory to let nothing interfere with the selection of the most competent man available. He also showed his recognition of the importance of public health work in putting fitness above political considerations.

The Mayor also suggested the appointment of an advisory committee consisting of the Deans of the University of California and Stanford Medical Schools, the President of the County Medical Society, the Chairman of the San Francisco Health Council, and others, to consult with the Board of Health in the selection of the best fitted candidate. After a careful study of all sides of the question and the qualifications presented by some 10 candidates, the committee unanimously recommended Dr. Geiger. The *San Francisco Chronicle* quotes Mayor Rossi as follows:

San Francisco is to be congratulated on the appointment of Dr. Geiger as Health Officer. I was deeply concerned in the selection of a man who would be a worthy successor of the late Dr. Hassler, who brought our Health Department to its present state of recognized efficiency.

In the selection of Dr. Geiger neither politics nor influence played any part. Guarding the health of our population is too serious a problem to admit of any criterion in the selection of a health officer other than outstanding and recognized ability in this highly specialized department of medical science.

Dr. Geiger is a native of Louisiana. He was graduated with the degree of Doctor of Medicine from the Medical Department of Tulane University in 1912. He was for 8 years Director of the Laboratory of the California State Board of Health, and for 5 years Executive Officer and Deputy Health Commissioner of Chicago. In addition to his degree of Doctor of Medicine, he holds the honorary degree of Doctor of

Public Health, which was conferred on him for important research on mosquito control. More recently he has been Professor of Epidemiology of the University of California Medical School and the George William Hooper Foundation for Medical Research. During the World War he served with the U. S. Public Health Service at Camp Pike, Ark., on mosquito control work. Later he became epidemiologist for the commission which studied botulism under the direction of Professor Jordan of the University of Chicago. In this work he traveled over a large part of the United States investigating many outbreaks of food poisoning. Dr. Geiger is epidemiologist to the Southern Pacific Railway and the Dollar Line of steamships. In this latter capacity, during the summer of 1931, he made a trip to the Orient for the purpose of studying ventilation on immigrant ships. It will be remembered that many cases of meningitis have occurred among immigrants on ships from the Orient, especially the Filipinos. The study was made particularly in view of this fact.

Dr. Geiger has had a wide and varied experience in public health work, and we can congratulate the City of San Francisco in obtaining the services of so competent a scientist as well as an executive. Let us hope that the enlightened action of Mayor Rossi will soon be the rule and not the exception, assuring communities of merit, and worthy officers of security of tenure.

ASSOCIATION NEWS

LOUIS I. DUBLIN, PH. D.

MEMBER OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

LOUIS I. DUBLIN was born in Kovno, Lithuania, November 1, 1882, and was brought to this country in 1886. He was educated in the public schools of New York, and graduated from the College of the City of New York in 1901. Between 1901 and 1904, he was a graduate student in biology at Columbia University, receiving his doctor's degree in 1904. In 1907, he undertook for the New York City Department of Health a survey of the tuberculosis situation, reviewing existing facilities for clinical and sanatorium care. After some months of service in life insurance medical statistics, Dr. Dublin was invited to collaborate with the late Lee K. Frankel and Miles M. Dawson in the preparation of *Workingmen's Insurance in Europe*, a survey for the Russell Sage Foundation of insurance systems, and their health promotion auxiliaries, in Europe, published in 1909. During 1909 and 1910, Dr. Dublin also served as lecturer on actuarial mathematics at New York University. In 1911, he became Statistician of the Metropolitan Life Insurance Company, and since has specialized largely in vital statistics and closely related subjects having a direct bearing upon the life and health conservation function of life insurance institutions.

From 1917 to 1923, Dr. Dublin was visiting lecturer on vital statistics in the Department of Public Health at Yale Medical School. In 1918 and 1919 he served under Dr. William Charles White as Statistician to the Commission for Tuberculosis of the American Red Cross in Italy.

Dr. Dublin is the author of *Mortality Statistics of Insured Wage Earners and their Families* (1919); editor of *Popu-*



LOUIS I. DUBLIN, Ph.D.

lation Problems in the United States and Canada (1926); *Health and Wealth* (1928). He was also co-author of *The Money Value of Man* (1930) with Alfred J. Lotka, and with the late Lee K. Frankel, of *Principles of Life Insurance* (1911). He has published in proceedings of various learned associations, in magazines and the daily press numerous papers and addresses on subjects

in the public health and safety field, specifically on problems of racial and occupational mortality, infant and child mortality, cancer mortality, tuberculosis, the birth rate, population, sickness incidence and costs, etc.

During his 20 years of membership in the American Public Health Association, Dr. Dublin served for a time as Secretary of the Vital Statistics Section, and as Treasurer from 1925 to 1928 and again 1929-1931. He was President of the American Statistical Association, 1924; Chairman of the Statistics Section, National Safety Council, 1930; Secretary of the Section on Social and Economic Science, American Association for the

Advancement of Science, and a Vice President of that Association. At present he is Chairman of the American National Committee of the International Union for the Scientific Investigation of Population Problems, a member of the National Malaria Committee, the Medical Council Research Committee, United States Veterans Administration, and of Committees and Boards of Directors of many health and welfare organizations. In September, 1931, he was elected Third Vice President and Statistician of the Metropolitan Life Insurance Company, and at the Montreal meeting of the American Public Health Association, 1931, he was chosen President.

JOHN A. FERRELL, M. D.

PRESIDENT-ELECT OF THE AMERICAN PUBLIC HEALTH ASSOCIATION

DR. John A. Ferrell was born at Clinton, N. C., December 14, 1880. He was graduated from the University of North Carolina with the degree of B.S. in 1902 and with the degree of M.D. in 1907. For 3 years, from 1902 to 1905, he taught in the public schools and was county superintendent of schools in his native County of Sampson, N. C. After graduation in medicine, he did general practice for 2 years in a small town and was county health officer of Pender County, N. C. Through these two early experiences, as teacher and county superintendent of schools, and as general practitioner and county health officer, he acquired an appreciation of the fundamental relation of education to public health and gained an understanding sympathy for the interest of the rank and file of the medical profession that has contributed in no small way to his subsequent professional career.

Early in 1910, with the organization of the Rockefeller Sanitary Commission,

Dr. Ferrell was placed in charge of the Commission's work in North Carolina. For the next 3 years, 1910-1913, he directed an educational campaign against hookworm disease that resulted in the microscopic examination of 320,000 people, one-seventh of the population of the state, and in the treatment of 160,000 persons for the disease, that is, one-fourteenth of the population. So impressive was the conduct of the work in North Carolina for the eradication of hookworm disease that, with the transition of the Rockefeller Sanitary Commission into the International Health Board with its world-wide program, Dr. Ferrell was chosen as the Director for the United States.

Dr. Ferrell has contributed in a large way to the development of the basic policies that have characterized the work of the International Health Board, not only in its relation to the states of the Union, but in its relation to foreign countries. These basic policies, playing so important a part as they have in

the development of state and county health work in the United States, so completely reflect the mind of the Director of the International Health Board for the United States that they are mentioned here as reflecting the thought of the man whom the Association has honored with its high responsibilities. In general, the policies of the International Health Board are far-sighted, permanently constructive, and self-effacing; the agency itself never appearing in the foreground of the picture, indeed, rarely appearing at all. In particular, the International Health Board has followed consistently three guiding policies:

First, it has set up no new machinery through which to identify and perpetuate itself, but has always exerted its influence and made its contributions through the official, permanently constituted agencies of public health, the state and county health departments.

Second, the International Health Board has never undertaken work with the constituted authorities until after preliminary studies were sufficiently convincing to indicate that such work, once begun, would so appeal through its obvious merits to the constituency for whom it was done as to become, after a short period of time, self sustaining. The contributions of the International Health Board, therefore, have been predicated upon services so worth while that, if sustained through their initial development, would permit gradual withdrawal of the supporting agency and become established services.

Third, the International Health Board, with its world-wide viewpoint and experience, sharing the opinion of all authorities in the field of public health as to the most vital and essential need in the further progress of the movement, namely, adequately trained personnel, has during the last 15 years made large contributions for the establishment and maintenance of schools for

the training of public health officials, Dr. Ferrell himself being one of their first graduates, having received his



JOHN A. FERRELL, M.D.

Dr.P.H. from the Johns Hopkins School of Public Health in 1919.

Dr. Ferrell's contacts with the health officers of the United States have perhaps been, during his service of 21 years with the International Health Board, more extensive and more intimate than that of any public health official identified with the broad phases of the public health movement, and in all of these contacts his whole attitude has been one of broad understanding, genuine helpfulness and self effacement.

In his extensive contacts, Dr. Ferrell has very naturally been prominently identified with other organizations, having served as Chairman of the Public Health Section of the American Medical Association 1922-1923, as a member of the Council of the American Public Health Association 1926-1929, as

Chairman of the National Malaria Committee 1924, and as Secretary of the North Carolina Medical Society 1911-1913. He is author of numerous papers and booklets on public health service.

HEALTH DEPARTMENT REPORTS

AT the meeting of the Editorial Board of the *American Journal of Public Health* in Montreal, Professor Ira V. Hiscock suggested that it would be better for him in future to send his reviews of "Health Department and

other Reports" to Dr. Henry F. Vaughan to be incorporated in the section of Public Health Administration. It was decided to try this for the present; so readers may look for that material in the section noted.

All readers of the *Journal* are greatly indebted to Professor Hiscock for the very careful and excellent reviews which he has contributed for a number of years. The *Journal* takes this opportunity of expressing its appreciation of his services.

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PUBLIC HEALTH ADMINISTRATION

Health in Syracuse—The staff of the Health Department numbered 172 in 1930, of whom 130 were full-time employees. The department is organized under 13 bureaus. The appropriation by the city was \$314,000 for health work or \$1.49 per capita. In addition to this, the Milbank Memorial Fund provided a grant of \$17,000 and paid for the services of 4 employees, while 7 others were paid by Syracuse University, and 3 by the Child Health Committee supported by the Community Chest. The death rate was 11.7 per 1,000 population, the lowest on record for this city.

Save for an outbreak of poliomyelitis with 150 cases, there were no abnormal conditions with regard to the communicable diseases. Diphtheria continued to decline, there being 23 cases compared to 31 in 1929, and only 2 deaths as compared with 4 for the preceding year. There were 4 cases of smallpox reported and there has not been a death for 42 years. The tuberculosis death rate has declined from 146 per 100,000 in 1908 to 47.7 in 1930, and 83 per cent of cases are now reported prior to death. There were known in the city 1,441 cases of tuberculosis. Of the fatal cases, nearly 40 per cent were reported more than a year prior to death.

Health education has received special emphasis in the Syracuse Health Department. During the year the newspapers were generous in the space given to health education, a total of 11,400 inches being given. The articles were illustrated with 101 pictures and there were 171 editorial comments. There were 51,600 copies of the monthly bulletin published, the mailing list being

4,000 per month. A regular weekly radio talk was broadcast. Application of the *Appraisal Form* gave a rating of 823 points. All divisions save venereal diseases, school hygiene, and preschool work rated 85 per cent or better.—George C. Ruhland, *Annual Report*, 1930.

Health in San Francisco—An appraisal has been made of the public health program for San Francisco for 1929–1930 by Professor Ira V. Hiscock. The government of the city and county combined is administered by a mayor and a board of 18 supervisors. The Board of Health consists of 7 members of whom 3 must be physicians. The term of office of each is 7 years. A full-time health officer is appointed under civil service regulations. The Board of Health, in addition to administering the health department, is responsible for the operation of the city hospitals, and the relief home. Plumbing inspection continues as a function of the health department.

In 1929 the personnel of the health department proper included 199 full-time and 28 part-time employees, of which number 72 were public health nurses and 49 inspectors.

The appropriation of the Board of Health for 1928–1929 was \$2,426,000, of which \$486,000, or \$.76 per capita, were used for public health services proper. The application of the *Appraisal Form* showed a score of 826 points which is one of the highest attained by any city thus far scored. Sixty-three per cent of this score is due directly to the efforts of the Board of Health, while 4 per cent is contributed

by the Board of Education, and 33 per cent by the voluntary agencies including the medical schools, clinics, Visiting Nurse Association, Tuberculosis Association, and child health agencies. Venereal disease control, tuberculosis control, infant and preschool hygiene, and popular health inspection scored less than 80 per cent.

Of the 7,968 deaths in the city in 1929, 282, or 3.5 per cent, occurred among the Chinese population, which represents 1.5 per cent of the total population, and 8.5 per cent of the tuberculosis deaths were among the Chinese. There is need of better analysis and graphic presentation of vital statistics. There should be a comprehensive program for a vigorous immunization campaign against diphtheria and scarlet fever.

The reporting of venereal diseases averages about half of what might be expected. There is need for more medical and nursing follow-up service. San Francisco has one of the lowest infant death rates of any American city. The mortality death rate has decreased from 75 per 1,000 births in 1915 to 49 in 1929. The infant mortality among the Chinese in 1929 was 71 as compared with the rate of 98 in 1921.

Clinic services have been extensively developed and are conducted along modern lines. There is need, however, of an increased nursing personnel for home visits on behalf of infants. The school health service is a joint function of the Board of Health and the Board of Education. Annual examinations are being made in the kindergarten, first and fifth grades, and parents are urged to be present.

Vigorous efforts should be made to secure an increase in the personnel of the nursing division and it is recommended that a generalized public health nursing district be established for experimental purposes.

The milk supply is obtained from 200 producing farms and 97.9 per cent of the supply is pasteurized. The per capita consumption is 0.63 pints per day. Most of the producing dairies are located within a radius of 40 miles of the city. The work of the Sanitary Bureau is well organized and scores 99 per cent.—Ira V. Hiscock, *Appraisal of Public Health in San Francisco*, Committee on Administrative Practice, A. P. H. A., 1931.

Health in Memphis—Under the supervision of Dr. W. F. Walker, a survey has been made of health problems and facilities in Memphis and Shelby County, Tenn. In 1929, the staff of the department included 87 full-time and 14 part-time employees, in contrast to 49 full-time and 6 part-time employees in 1919. The total expenditures for public health activities in 1929 amounted to \$152,776.83 or \$.79 per capita, of which sum \$.28 were spent for public health nursing. Of the taxpayers' dollar, \$.02 were spent for health work.

Application of the *Appraisal Form* gave a weighted score of 619 points, the principal weakness being in the divisions of Infant, Preschool, and School Hygiene and popular health instruction, each of which rated less than 50 per cent of the standard.

The total death rate including resident and nonresident was 20.1 per 1,000 in 1929, being 15.7 for the white population and 29.0 for the colored. Excluding the nonresident deaths, the rate was 15.7 for the total population, 10.5 for the white population, and 26.2 for the colored. One factor which contributes to the high death rate is that Memphis is a hospital center for the surrounding area, 21.8 of all deaths having been among nonresidents. This is high when compared with the average American city. The death rate from tuberculosis

of all forms was 176.1 per 100,000, the rate being 70.1 for the white, and 387.2 for the colored. There is need for the execution of a plan to transfer to private physicians the responsibility for diphtheria immunization and medical examinations of preschool and school children.

A large number of births occurred in hospitals, 55 per cent of total births, 67 per cent for the white and 38 per cent for the colored. The maternity service attained the high score of 93 per cent; a total of 1,816, or 46 per cent, of all the births which occurred in 1929 were registered at the prenatal clinic of the Health Department. The work of the Sanitary Bureau is well organized, there being a special effort to secure installation of sewer connections in parts of the city which have previously been unserved.

Malaria control work has been en-

gaged in with extensive ditching and drainage to eliminate mosquito breeding places. There were 214 cases of malaria reported between June 15 and Oct. 1, and a special effort was made to popularize education in malaria prevention. The public health nursing division has made noteworthy progress although there is need for an increase in the nursing staff. The major change in organization recommended is the administration of all activities relating to tuberculosis control through a division of tuberculosis. It is also recommended that the departmental staff be increased to 119 full-time and 21 part-time employees, and that the yearly appropriation for 1930 be increased to \$205,091. —*Survey of Health Problems and Facilities in Memphis and Shelby Counties, Tennessee, for 1929*, Shelby County Tuberculosis Society, Memphis.

LABORATORY

A STUDY OF THE EIJKMAN METHOD FOR DETECTION OF FECAL CONTAMINATION OF WATER*

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EIJKMAN¹ attempted to simplify the method for detecting colon bacilli in water by taking advantage of the fact that fecal strains can be grown at 46° C. He incubated inoculated lactose broth fermentation tubes at this temperature and interpreted the results

on the basis of gas formation. Brown and Skinner² found that only a small percentage of colon bacilli isolated from human feces produced gas in 24 hours at 46° C., and that 48 hours were necessary to include all gas-formers. They also found that many "typical" colon bacilli from polluted streams failed to grow in the Eijkman broth at 46° C. and that the test did not entirely eliminate *B. aerogenes*.

* This paper is abstracted from a thesis prepared in partial fulfillment of the requirements for the degree of Master of Science in the Graduate School of the University of Pennsylvania.

In order to test the value of the Eijkman method of detecting colon bacilli in water the following studies were carried out.

One hundred and sixty colon-like organisms from various sources were fished in duplicate from Endo plates—82 were from Endo plates inoculated with samples of human feces from 82 different persons, 3 were from plates inoculated with urine, and 75 came from as many different samples of water. All the cultures from the Endo plates were inoculated into lactose broth in duplicate. One culture was inoculated at 37° C. and the other at 46° C. for 48 hours.

Each strain was studied to determine its morphology, motility, and Gram staining reaction; its ability to liquefy gelatin, to produce indol, to form acetyl-methyl-carbinol, to grow in citrate solution; and to test its power to ferment sucrose and lactose broth. Three species were isolated—*B. coli communis*, *B. coli communior*, and *B. aerogenes*. These were divided in three groups. Group I included the organisms that gave acid and gas in lactose broth at 37° C. and at 46° C.; Group II included those that showed acid and gas at 37° C. but neither acid nor gas at 46° C.; Group III comprised the strains that gave acid and gas at 37° C. but only acid at 46° C.

Of the strains from human feces classified in Group I, 36 were *B. coli*

communis, 22 *B. coli communior*, and 2 were *B. aerogenes*. In Group II, 2 were *B. coli communis*, 3 *B. coli communior*, and 2 were *B. aerogenes*. In Group III, 6 were *B. coli communis*, 8 *B. coli communior* and 1 *B. aerogenes*.

Of the strains from urine in Group I, 1 was *B. coli communis* and 1 *B. coli communior*. In Group II, 1 was *B. coli communior*.

Of the strains from water in Group I, 19 were *B. coli communis*, 17 *B. coli communior* and 10 were *B. aerogenes*. In Group II, 2 were *B. coli communis*, 6 *B. coli communior* and 2 were *B. aerogenes*. In Group III, 7 were *B. coli communis*, 5 *B. coli communior*, and 7 were *B. aerogenes*.

It is concluded that the Eijkman test is not trustworthy because of the great variation in the results obtained. Even though many cultures of the three species studied produced acid and gas in lactose broth at both 37° C. and 46° C., the percentage of gas was, on an average, lower at the higher temperature. Many otherwise typical strains of *B. coli communis*, *B. coli communior*, and *B. aerogenes* produced no gas but only acid at 46° C. or neither acid nor gas at this temperature although they fermented lactose at 37° C. with the formation of both acid and gas.

REFERENCES

1. Eijkman, C. *Centralb. f. Bakt.*, 37: 742, 1904.
2. Brown, J. W and Skinner, C. E. *J. Bact.*, 20: 139, 1930.

SIMPLE TEST FOR AVAILABLE CHLORINE STRENGTH OF DAKIN'S AND OTHER SODIUM HYPOCHLORITE SOLUTIONS OF EQUIVALENT STRENGTH

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WHILE both the arsenious acid-iodine-starch titrimetric method and the dilution-orthotolidin colori-

metric method for the determination of available chlorine in hypochlorite solutions seem simple enough in the hands

of a chemist or skilled technician, these methods are apparently too difficult to find general application in the routine work as carried out in the great majority of hospitals. Realizing the need for a rather simple test whereby a comparatively unskilled helper can at intervals check the strength of Dakin's and other equivalent chlorine solutions, we have devised a modification of the above mentioned procedures.

PRINCIPLE

In the proposed method the percentage of available chlorine in Dakin's and other equivalent hypochlorite solutions is taken arbitrarily to lie between 0.45 and 0.55 per cent (For practical purposes these limits are close enough to the U. S. P. limits of 0.45 and 0.50 per cent for the modified Dakin's solution). With this as a basis, the quantity of standard tenth normal arsenious acid solution necessary to neutralize exactly a definite fixed quantity of chlorine solution is calculated for each of these limiting strengths. Thus by adding these calculated quantities of standard arsenious acid solution to two separate but fixed and equal quantities of Dakin's solution there is complete neutralization of the chlorine in one, and only partial neutralization in the other. The completely neutralized solution will show no color change on the addition of orthotolidin, while the partially neutralized solution will show a yellow or even orange color, depending on whether the particular solution in question approximates 0.55 or 0.45 per cent of available chlorine.

APPARATUS

Pipette graduated to deliver 5 c.c. Dakin's or equivalent chlorine solution. (Note: Our test is based on the use of a 5 c.c. sample of the solution to be tested.)

Pipette with two graduations, the first to deliver 6.43 c.c. N/10 As_2O_3 , the other to deliver 7.86 c.c. N/10 As_2O_3 .

Two 2-oz. ground glass stoppered bottles to be marked No. 1 and No. 2 respectively for convenience.

1 c.c. medicine dropper for orthotolidin.

Reagents

Standardized N/10 As_2O_3 solution.

Standard orthotolidin solution.

PROCEDURE

To each of the 2-oz. bottles add approximately 20 c.c. of distilled water and then exactly 5 c.c. of the solution to be tested.

To bottle No. 1 add standard arsenious acid solution as measured by the lower mark on the graduated pipette or 6.43 c.c.

To bottle No. 2 add standard arsenious acid solution as measured by the upper mark on the graduated pipette or 7.86 c.c.

Shake contents of both bottles.

Add 1 c.c. orthotolidin solution to each bottle.

RESULTS

No color in either bottle—solution tested weaker than the accepted Dakin's solution.

Yellow to orange color in bottle No. 1 but no color in bottle No. 2—solution tested has correct strength for accepted Dakin's solution.

Color in both bottles—solution tested is stronger than accepted Dakin's solution.

With the aid of this test previously prepared solutions can be adjusted to the Dakin's strength by either strengthening or diluting them as the case may be. Where both bottles show color the depth of color can be used as a guide in determining further dilution.

This procedure is not applicable for testing solutions containing oxidizing agents other than chlorine. It is intended only for solutions of chlorine or hypochlorites in which available chlorine is between 0.45 and 0.55 per cent.

VITAL STATISTICS

Census of Scotland, 1931—The population of Scotland on April 26, 1931, was 4,842,554, of whom 2,325,867 were males and 2,516,687 females. At the census of 1921 the total population was 4,882,497—2,347,642 males and 2,534,855 females. The 1931 population is thus 39,943 less than that reported at the 1921 census, the decrease of males being 21,775 and that of females 18,168. The intercensal decrease of the total population is equivalent to 0.8 per cent of the 1921 population, that of males being 0.9 per cent of the male population in 1921, and that of females 0.7 per cent of the female population in 1921. The number of females in the population exceeds that of males by 190,820. This excess of females over males is only 3,607 more than at the census of 1921, but is greater than at all previous censuses—the maximum difference previously being that of 1921, viz., 187,213. The ratio of females to males which was 108.0 to 100 in 1921 is now 108.2 to 100, though this ratio is not itself a maximum.

This is the first official census of Scotland which records a decrease of population. The first census was taken in 1801, when the population was reported to be 1,608,420, and each successive decennial census showed an increase, culminating in a total population of 4,882,497 at the census of 1921. The largest of these increases was one of 446,456 at the census of 1901. In 1911, the increase fell to 288,801 and in 1921 to 121,593. The natural increase of population in Scotland, i.e., the excess of births over deaths, during the intercensal period, amounted to 352,386, and as a decrease of 39,943

was found in the population, 392,329 may be taken as a measure of the population lost by migration. The natural increase in 1921–1931 was smaller than in any intercensal period since 1871.

The decrease of population in Scotland at the present census has been general in the counties. Only 6 out of the 33 counties (inclusive of burghs) show an intercensal increase, the 2 most noteworthy being increases of 2.2 per cent in the case of Lanark and 3.9 per cent in Midlothian. Decreases are recorded in 27 counties, amounting to 8.4 per cent in Orkney, 9.3 in Caithness, 9.6 in Sutherland, 11.3 in Ross and Cromarty, and 16.1 in Zetland. The counties of Argyll and Bute show the much greater decreases of 18.0 and 44.2 per cent, respectively, but both of these counties were materially affected by the taking of the 1921 census in the holiday month of June—the populations then returned being altogether abnormal and not admitting of comparison with the results of the present census. The same consideration to a less extent affected the holiday areas of other counties, e.g., Ayr and Fife. Even at the recent census the presence of visitors in appreciable numbers has been noted in the returns of certain holiday resorts.

Of the total population of Scotland 38.6 per cent are embraced in the four chief cities of Edinburgh, Glasgow, Dundee and Aberdeen, 15.7 per cent in the remainder of the 24 larger burghs as defined by the local government (Scotland) act, 1929, and 15.1 per cent in the small burghs, giving a burghal population of 3,361,384 or 69.4 per cent of the entire population, against 3,334,499 or 68.3 per cent at the census of 1921—an increase of 0.8 per cent. Of

the 24 large burghs 15 show an increase of population over that of 1921. The largest increases recorded are 36,890 in Glasgow, 18,734 in Edinburgh, 8,296 in Aberdeen and 7,268 in Dundee. The largest percentage increases are 7.8 in Inverness, 6.2 in Falkirk, 5.9 in Kilmarnock and 5.8 in Stirling. The largest decreases recorded are 4,945 in Dunfermline, 4,161 in Motherwell and Wishaw, 2,185 in Greenock, and 1,859 in Arbroath. The largest percentage decreases are 12.4 in Dunfermline, 9.5 in Arbroath, 6.9 in Port-Glasgow, and 6.0 in Motherwell and Wishaw and in Dumbarton. The abnormal decrease in Dunfermline is doubtless due to some extent to changed conditions at Rosyth. Some portion of the apparent increase shown in the large burghs may be ascribed to the absence of persons on holiday at the date of the 1921 census.

It is, however, the county areas outside the large burghs that have contributed most to the decrease in the total population. The population of the small burghs has declined from 769,245 in 1921 to 730,221 in 1931, a loss of 39,024 or 5.1 per cent, and that of the landward portions of the counties has fallen from 1,547,998 in 1921 to 1,481,170 in 1931—a decrease of 66,828 or 4.3 per cent. Thus while the population of the burghal area of Scotland has increased by 0.8 per cent, that of the landward area has decreased by 4.3 per cent. In the period 1911 to 1921 the rates of increase for the 2 areas were almost identical, being 2.6 per cent for the burghal area and 2.4 per cent for the landward.

In only 4 of the 33 Scottish counties are landward increases recorded in 1931, 6.5 per cent in Renfrew, 3.1 per cent in East Lothian, 1.1 per cent in Lanark, and 0.1 per cent in Midlothian. Elsewhere in the landward areas the decrease was general, the principal percentage decreases being 9.5 in Orkney, 9.7 in Sutherland, 9.8 in Kincardine,

11.5 in Caithness, 12.0 in Ross and Cromarty, and 17.1 in Zetland. Decreases of 14.5 per cent in the landward of Argyll and of 41.6 per cent in the landward of Bute are, as already explained, largely due to the presence of holiday populations in 1921. It will be observed that the increases and the smaller decreases are generally in those counties in which the landward areas are to some extent of an urban or semi-urban character, and that the larger decreases are in those counties, chiefly in the North and North-West, which are more rural in character.—*Prelim. Rep. Fourteenth Census of Scotland, 1931, p. 6-7.*

Abortion and Birth-Rate in Hungary—The number of abortions in Hungary has more than doubled in the last 20 years; at the same time the birth rate has fallen from 40.5 to 24.7 per 1,000. The number of abortions amounts to between 110,000 and 120,000 every year, and of these 70 per cent are criminal abortions. The cause of this state of affairs is attributed to the lax standards of doctors as to indications for induced abortions.

According to Hungarian law, pregnancy may be interrupted only if the life of the mother is earnestly menaced by pregnancy as such. The actual text of the law does not recognize even this indication, although legal practice has countenanced it. According to prominent Hungarian gynecologists, the law should be revised and reworded.

According to a recent lecture by Dr. Fekete, lecturer to the University of Budapest, it is generally held in Hungary that to allow artificial abortion without restriction would be equivalent to national suicide. In Soviet Russia artificial abortion was declared permissible in 1920, but only in institutions, and this has not proved an ideal method of dealing with the problems.

The public is not wholly aware of the

dangers of abortion; the mortality amounts to 1.2-3 per cent, and morbidity follows in 14 per cent of the cases, even if the operation is performed in well-equipped, modern operating theatres. In Hungary more than 1,200 women succumb to artificial abortion every year, and 6,000 to 8,000 women have ill-health following the operation.

The loss of population due to abortion ought at least to be compensated for by the increased care and protection given to mothers and infants but in Hungary the proportion of maternity beds to births is 990 to 200,000. In some places the ambulance has to carry a woman in labor a distance of 35 to 70 miles.—*Lancet*, 2: 314 (Aug. 8), 1931.

Vital Statistics for New Zealand, for the Year ended March 31, 1931—The mean population of the Dominion of New Zealand (exclusive of Maoris) for 1930 was estimated to be 1,425,084. This represents an increase over the corresponding figure for the previous year of 18,142, or a percentage increase of population of 1.29. The births of 26,797 living children were registered during 1930 as against 26,747 in 1929, bringing the birth rate for 1930 down to 18.80 as compared with 19.01 in 1929, 19.56 in 1928, 20.29 in 1927, and 21.05 in 1926. With 12,199 deaths and 26,797 births, the excess of births over deaths was 14,598 persons, or a natural increase of 1.0 per cent only of the total population. In 1870 the natural increase was 3.1 per cent.

There were 12,199 deaths in 1930 as compared with 12,314 in 1929, lowering the death rate from 8.75 in 1929 to 8.56 in 1930. Heart disease (all forms), apoplexy, or cerebral hemorrhage, and diseases of the arteries, combined, accounted for 3,988 or 32 per cent of the total deaths in New Zealand in 1930. In 1929, these diseases accounted for 29 per cent, and in 1928 for 28 per cent of the total deaths. Cancer has shown

an increase during the last 5 years. In 1926 the death rate from this disease was 99.1 per 100,000 as compared with 101.9 in 1930. The 1,452 cancer deaths in 1930 comprised 11.90 per cent of the total deaths from all causes. New Zealand has the lowest death rate from tuberculosis in the world. In 1930, the lowest rate (45.5 per 100,000 population) in the last 5 years was reached, but even so, tuberculosis still took fifth place as a cause of death in New Zealand.

Among the common infectious diseases, pneumonic influenza, diphtheria, typhoid fever, and scarlet fever all showed decreases within the last year. The death rates per 100,000 population for 1929 and 1930 respectively were: pneumonic influenza, 8.5 and 4.6; diphtheria, 6.5 and 4.1; typhoid fever, 1.6 and 0.5; and scarlet fever, 1.9 and 1.1. Neither whooping cough nor measles is compulsorily notifiable in New Zealand.

There was a slight increase in the infant mortality in 1930, when the death rate of infants under 1 year of age was 34.48 per 1,000 live births as compared with the 1929 rate of 34.10. The reduction in infant mortality in the last five years, however, has been considerable—from 39.76 in 1926 to 34.48 in 1930.—*Report of the Director-General of Health, New Zealand, for the Year ended Mar. 31, 1931*, p. 5-9.

Vital Statistics for Illinois, 1930—Since reliable statistics have been kept, the State of Illinois has never experienced as low a birth rate as the one reached in 1930. There were 128,121 births recorded, giving a birth rate of 16.7 per 1,000 population. The excess of births over deaths was 44,529 and the difference between the birth and death rates was 5.8 per 1,000 people, indicating a net increase in the population from reproductive sources of 0.6 per cent. Experience in the past indicates that from 1,000 to 2,000 delayed birth re-

ports will be filed during 1931 and from 100 to 200 death certificates. These additions will make no significant difference in the rates, however.

The general death rate in 1930 was 10.9 per 1,000 population. Never before since the state was admitted to the death registration area in 1918 has the death rate been so low. The best previous record was in 1921 when the rate was 11.1. The total number of deaths from all causes in 1930 was 83,592.

The number of deaths from typhoid fever in Illinois went up from 110 in 1929 to 154 in 1930, causing an increase in death rate per 100,000 population from 1.4 in 1929 to 2.0 in 1930. Prior to 1900 most of the typhoid fever occurred in the cities. Now most of it occurs in the small towns and rural communities. In 1930, for example, the death rate from typhoid in Illinois cities of more than 10,000 population was 1.4 per 100,000 people while the rate in the remainder of the state was 3.0. The urban rate would have been still lower if no fatal cases from rural districts had obtained hospital care in the cities. Typhoid fever has become a problem chiefly of the southern third and the rural parts of the state.

The year 1930 marked a new low level for tuberculosis. Deaths from this disease numbered only 4,790 against 5,244 in 1929, giving death rates of 62.5 and 70.0 for 1930 and 1929 respectively. In no previous year since 1886 when the population was only half its present number had less than 5,000 deaths from tuberculosis been recorded in Illinois. There were 545 fatalities from diphtheria, giving a death rate of 7.1. Of these deaths, 411 occurred in Chicago, and 134 down-state, making the death rate for Chicago 12.1 and that for the remainder of the state 3.2. Excepting in 1927 when 102 deaths occurred, infantile paralysis mortality was heavier in 1930 than in any year since 1921. There were sixty deaths, giving

a death rate of 1.2 from this cause in 1930. The scarlet fever death rate of 4.0 per 100,000 population is identical with the rate for 1929. Though the prevalence of this disease was high in both years the fatality was low, averaging less than 2 deaths per 100 cases. Pneumonia was responsible for 5,272 deaths in 1930; the death rate of 68.8 is lower than the lowest previous rate (78.8), which was recorded in 1921. Measles caused 90 deaths, giving a death rate of 1.2, which rate was second only to the rate of 1.1 which was attained in 1928.—*Illinois Health Quarterly*, 3: 152-159 (Apr.-June), 1931.

Analysis of the Census of 1926 for the Irish Free State, According to Ages, Orphanhood and Conjugal Conditions—According to a preliminary analysis (by ages, orphanhood and conjugal conditions) of the statistics contained in the 1926 census of the population of the Irish Free State, the proportion of persons unmarried in the Saorstát at each age is much higher than in any other country and marriages take place here at a comparatively late age. This applies both to males and females. At age 35-40, there are, in proportion to the population, three times as many unmarried males as in either Denmark or England and Wales. Of the females, 62 per cent are unmarried at the age of 25-30, whereas in the United States only 23 per cent are unmarried at that age. Moreover, this situation is steadily growing worse year by year. In 1841, 15 per cent of both males and females, at age 35-45, were single but in 1926 the number of single males at that age had increased to 45 per cent and single females to 29 per cent.

More males are unmarried at every age in the rural areas than in the towns. With respect to the females, however, this is true only of the early ages; above 35, a larger percentage of the females

are unmarried in the towns than in the rural areas.

The Saorstat has few married women of child bearing age. In proportion to the population there are only half as many married women under 45 years of age as are in the United States; only about 61 per cent of the number in England and Wales and about 66 per cent of that in Denmark.

Nevertheless, the married women of the Saorstat rear far more children than those in other civilized countries. In 1926, there were 131 children under 5 years per 100 married women under age 45, compared with 77 in the United States, 75 in Germany and 71 in England and Wales. Furthermore, this rate has not been declining as in other countries; in 1861 it was 130 as compared with 131 in 1926. In England and Wales, on the contrary, it decreased from 116 in 1861 to 71 in 1926.

Owing to the late marriages, the average age of Irish Free State mothers is much higher than in other countries. If the average age of married women in other countries were the same as in the Saorstat the difference in fertility would be even more marked. On this basis, the Irish mother raises more than twice as many children as the American mother and almost twice as many as a

married woman in England and Wales. The general birth rate, however, is kept down as a result of the shortened child-bearing period caused by the late marriages.

Another result of the advanced age at marriage is the high death rate of parents of young children. Consequently, a larger proportion of orphans under 15 years of age are to be found in the Saorstat than is usual in other countries.

The lateness of marriage of males and the low death rate of elderly females result in a comparatively large number of widows, although marriages here are proportionately fewer than in other countries. In 1926, 41 per cent of the widows were over 70 years of age.

The Irish Free State has the largest number of persons over 65 years of age per 100 persons 15 to 65 of any other important civilized country. In 1926, the rate was 14.8 compared with 7.4 in the United States, 9.1 in England and Wales and 8.4 in Germany.

The expectation of life of males at birth in 1926 was 57.4 years but at age 70 it was 10 years; for females, at birth, it was 57.9 and at age 70, 10.7. As in other civilized countries the expectation of life has been increasing in recent years.—*Census of Population, 1926. Saorstat Eireann*, pp. 1-33.

PUBLIC HEALTH ENGINEERING

TRAINING FOR THE PUBLIC HEALTH ENGINEER*

DISCUSSION

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PROFESSOR Prescott has very clearly set apart the profession of public health engineering from that older branch of the engineering school with which it is even today so commonly confused, namely, sanitary engineering. This difference, as he has indicated and which the writer would re-state because of its importance, is largely one of emphasis. The sanitary engineer is primarily a designer or a builder. He is, in fact, a civil and hydraulic engineer specializing in a rather restricted field, confined for the most part to works relating to municipal water supply and sewerage.

The public health engineer on the other hand is primarily a student and worker in the field of public health. The range of his activities is wider, and his training and knowledge are of essentially different character. It is not so important that he know how to build a sewer as that he know why sewers are necessary and what results may be anticipated from the discharge of their contents without treatment into a body of water. Trained to think with the clearness and accuracy of an engineer, he employs as his material the data of physics, chemistry, and biology which

underlie the present-day practice of public health.

Working with the physician or the physiologist he may make important contributions in such fields as school hygiene, or industrial hygiene, when the problems are largely physiological or pathological. The writer assumes that Professor Prescott's inclusion of industrial hygiene and health hazards in industry, within the scope of public health engineering, refers to the environmental aspects of these problems and not at all to their purely medical aspects.

Professor Prescott has indicated in some detail the content of a 4-year undergraduate course at the Massachusetts Institute of Technology leading to the degree of Bachelor of Science in Public Health Engineering. It may be of interest, therefore, to refer in comparison to the postgraduate course offered at the DeLamar Institute of Public Health, College of Physicians and Surgeons, Columbia University, in which we attempt to accomplish essentially the same object in a distinctly different manner.

This course is based upon the reasoning employed above in defining the public health engineer. It is a course of 1 full year, of 12 months, open to acceptable graduates in civil engineering and leading to a degree of Master of Science in Public Health Engineering. It presupposes adequate engineering training

* Discussion of paper by S. C. Prescott, read before the Public Health Engineering Section of the A. P. H. A., at the Sixtieth Annual Meeting at Montreal, Canada, September 17, 1931 (see October JOURNAL, page 1091).

and attempts to provide the supplementary public health background necessary to direct the young engineer's activities into channels which are essentially new to him and which lead him to consider the relationships between the environment and human health. Among the prerequisites therefore are adequate courses in physics, chemistry and either general biology or bacteriology. Since these last two subjects are generally weak and sometimes lacking in engineering education, the candidate may be required to complete certain work in the summer school previous to entering upon his year's study, and in any event the laboratory work has to be begun in a more elementary manner than is usual in graduate studies.

We have the distinct advantage, however, of having the candidate strictly within a small department for most of his time, which permits of intensive courses and close correlation between courses. We believe it also to be an advantage, rather than otherwise, that the student has completed his formal engineering studies so that the entire time and attention of a somewhat more mature student can be devoted to systematic training in public health.

The major work of this course is given under the titles "Public Health Engineering" and "Public Health Engineering Practice." In the first of these the subject is dealt with along the lines of the writer's textbook, *Principles of Public Health Engineering*, namely, the three major environmental contacts—air, water, and food—and certain other miscellaneous environmental factors. Under air we study both ventilation and atmospheric pollution by cities and by industries; and under water, both water supply and sewerage, which we purposely link together as complementary; and under food we treat two examples, the pasteurization of milk and the sanitary control of the collection and marketing of shellfish.

Among the matters of secondary importance considered are illumination, municipal cleansing and refuse disposal, and insect and rodent control. In each of these topics the stress is upon the fundamental chemical, physical, bacteriological, physiological or biological data upon which the engineering practice rests, and each topic therefore provides in its turn a basis for the construction of a considerable educational edifice of public health material.

Public Health Engineering Practice is an advanced course in which a special problem of some magnitude is developed by each student in a comprehensive manner.

The other foundation courses are vital statistics in which the material dealt with is directly related to public health, epidemiology with special stressing of the environmental factors, and sanitary engineering laboratory methods in which, as previously indicated, the student generally starts at the beginning and learns enough of chemical and bacteriological technic to complete a satisfactory examination of air, water, milk, or shellfish, and to understand and interpret the results of such examinations as well as those of the more strictly medical tests of blood, urine, throat cultures, etc.

These classroom courses are all of seminar nature, made possible by small groups of students, and are accompanied by extensive collateral reading and frequent reports by the student. Finally there is required during the summer a so-called field study in which the candidate is assigned to some definite organization, such as a state department of health, and is allowed to select a specific topic for survey or investigation under the actual conditions of practical administrative work. He is also required to take, either in connection with his field work or during the year, one optional study closely related to his selected field study and these together

provide the basis for his graduating thesis which completes the requirements for the degree.

The course outlined here parallels another course designed primarily for graduates in medicine or for students having had at least a full pre-medical college course and who likewise take the first general course in public health engineering. The objective here, however, is to provide a background for the proper interpretation of their future work in epidemiology and public health administration. The seminar method of teaching permits of considerable latitude in the assignment of problems and topics

for discussion and each of the two groups of students admirably supplements the other's viewpoint, to their mutual advantage.

In this way we recognize what we believe to be an essential distinction in public health activities, namely, the medical and the engineering aspects. In either case we have found it distinctly advantageous that the doctor of medicine or the civil engineer, as the case may be, has come to the decision to enter the profession of public health as a specialty and comes to us well prepared and with a definite objective as to his future career.

The Use of Activated Carbon in Removing Objectionable Taste and Odors—The author suggests the use of the terms "carbon adsorption beds" and "carbon units" rather than "carbon filters." Experiments have been conducted in units of two sizes, one a bed 3.56' in diameter and the other glass tubes about 1 $\frac{5}{8}$ " in diameter. Such glass tubes have been found to give results comparable with those of the larger units.

The results of 17 months' operation of the larger unit with Hydrodarco are described. The flow was upward at the rate of 2 gal. per sq. ft. per minute and the bed was washed twice during the period in the manner used for rapid sand filters. In the glass tubes comparative tests were carried out using 5 types of carbon (Hydrodarco, Minchar, Woodchar, Bonechar and Nuchar), and the actions of a 48" bed of fresh carbon and of carbon taken from the larger unit after 13 months' use and revived by heating and by treatment with sodium hydroxide were tested.

The results are given in tables. It appears from these results:

1. That fairly deep beds are to be preferred, a bed 48" in depth with water applied at a

rate of 4 gal. per sq. ft. per minute reducing residual chlorine to a lower figure than a 24" bed at 2 gal. per sq. ft. per minute.

2. That either upward or downward flow can be used. The maximum rate with upward flow is about 4 gal. per sq. ft. per minute with 4-12 mesh Hydrodarco. Higher rates can be used with downward flow but friction losses are greater and more frequent washings are necessary.

3. That the most suitable form of revivification depends on what the material has adsorbed. Where loss of activity was due to gelatinous compounds clogging the pores of the carbon, revivification for dechlorination was successfully achieved by drying at 105° C. or treating with a hot solution of sodium hydroxide.

4. That materials differing widely in carbon content are suitable for dechlorination.

5. That superchlorination followed by dechlorination by active carbon removes practically all taste producing compounds likely to be found in water.

6. That 1 lb. of Hydrodarco will reduce the residual chlorine in about 30,000 gal. of water from 1.0 to less than 0.1 p.p.m. without revivification, using a carbon bed 24" deep at a rate of 2 gal. per sq. ft. per minute. By revivifying the material it is believed that 200,000 to 500,000 gal. of water may be dechlorinated per lb. of Hydrodarco.

—J. R. Baylis, *J. Am. Water Works Assn.*, 22: 1438, 1930. From *Summary of Current Literature, Water Pollution Research*, IV, 6 (June), 1931.

The Sewage Treatment Works of Zurich, Switzerland—An account is given of the sewage works of Zurich, Switzerland. The original plant, which was constructed to serve about one-third of the population so that experience could be gained for the design of the complete works, consists of rainwater overflow weir, grit chamber, 2" bar screen, sedimentation chambers, pumps for sludge, separate sludge digestion chambers, sludge drying beds and lagoons.

The effluent from the sedimentation chambers is discharged into the river Limmat and the ripened sludge is lagooned and sold as fertilizer. The main changes from the old plant in the construction of the new plant are enumerated. Cost data and diagrams of the sedimentation and digestion tanks are included.—M. Suter, *Sewage Works J.*, 2: 419, 1930. From *Summary of Current Literature*, Water Pollution Research, IV, 6 (June), 1931.

Use of Sewage Gas as City Gas—The chemical composition, the volume and dependability of supply, and the cost of sewage gas are considered with regard to its use as a city gas. Although sewage gas has a sufficiently high heating value to be useful, its slow rate of flame propagation is a disadvantage and its high specific gravity would necessitate a greater expenditure of power for pumping than in the case of the ordinary types of city gas; the flame characteristics would be greatly improved if the sewage gas were mixed with some other type of gas to increase the hydrogen content.

Sewage gas would afford a reasonably dependable source of supply but its maximum production could rarely exceed 1 per cent of that required for city gas and it would be produced in greatest quantities in the summer when it was least required. Its value to a gas company is equal to the enriching value and

today enrichment can be obtained considerably more cheaply from bunker fuel oil.

The effect of temperature on digestion and the use of sewage gas for tank heating are discussed. A great saving in plant may be obtained by maintaining the temperature of digestion tanks close to the optimum temperature for digestion, i.e., in the vicinity of 77° F. It has been found that if the sewage gas is collected and used for heating the tanks, the temperature may be maintained above 70° F. throughout the year and thus the rapidity of digestion and capacity of the plant may be greatly increased.

It is concluded that the collection of sewage gas is justified if it is burned to prevent nuisance or utilized for heating the contents of digestion tanks, but it is not justified in the United States for use as a substitute for city gas.—W. H. Fulweiler, *Sewage Works J.*, 2: 424, 1930. From *Summary of Current Literature*, Water Pollution Research, IV, 6 (June), 1931.

Refuse Disposal and Steam Power—The Huddersfield destructor was built solely for the utilization of the refuse to generate steam. The following conditions had to be met in the design of such a plant: (1) A constant output of steam per hour; (2) maximum steam production per lb. of refuse burnt; (3) a great degree of mechanization of refuse handling.

The plant as constructed is probably the most efficient steam raising refuse incineration plant in existence at present. The plant will produce a steady supply of steam hour after hour and day after day. A harder clinker is produced than usual and the manual labor used in handling the refuse is reduced to a minimum. All refuse, even dust—excepting metals—is incinerated.

The incinerator will handle 28,000 tons of refuse per year; 500 tons of

metal and 5,000 tons of clinker, besides the steam, will be recovered for sale. Innocuous dust will be the only material dumped and will amount to about 15 per cent of the total refuse.

The plant will handle 180 tons of refuse in 18 hours (calorific value—5,000 B.T.U. per lb. as charged), by means of 8 Woodall-Duckham furnace type cells. Each boiler is served by the gases from two cells. The refuse is discharged into a storage hopper below ground level from the collecting wagons. The refuse is raised from the storage hopper by means of a grab and conveyed to a rotary distributor.

From the distributor the refuse goes through a magnetic separator where the metals are removed. The metals are sent to a baling press and the other refuse is sent to an auxiliary storage pit from where it is delivered by means of a grab to the feeding hoppers. The refuse is fed to the furnaces by means of hydraulically operated rams and is burnt by means of a pre-heated high pressure air supply delivered through tuyeres placed at the lower part of the furnace.

The non-combustible portion of the refuse is converted into a hard clinker. The gases of combustion are drawn through water-tube boilers and ejected into the chimney by means of dust extracting waste-gas fans. Each boiler is fitted with dust collecting chambers and arranged so that dust can be removed during operation. The steam is supplied to the electricity department.

Each furnace cell has a hydraulically operated clinker knife and door through which the clinker is discharged into a skip. The clinker is quenched in a suitable quenching tower and then crushed and graded after passing

through a magnetic separator. The cost of the installation was £65,000.—Anon., *Surveyor*, 78, 2021: 383-386 (Oct. 17), 1930. From *Pub. Health Eng. Abstr.*, Jan. 31, 1931. Abstr. C. T. Carnahan.

Special Equipment and Careful Supervision in Los Angeles County Remove Objections to Garbage Disposal by Hog Feeding—A survey of 62 municipalities in this country indicates that the average cost of collecting garbage is \$2.94 per ton. Other data show that where garbage is disposed of by hog feeding an average of \$1.05 per ton is paid to the community by those collecting the garbage for disposal by hog feeding. Such disposal, therefore, reduces the net cost of collection to \$1.89 per ton.

There are extensive hog farms in use in Los Angeles County to serve 44 municipalities and very successful results have been secured because of expert supervision, inoculation of hogs, the use of concrete feeding platforms, suitable shelters and adequate equipment for the disposal of unconsumed garbage and manure. These results have been secured largely through the control of hog ranches by the Los Angeles County Live Stock Department.

Thirty-nine licensed ranches were operated in 1929 and only three complaints were received relative to nuisances. Two of these complaints were due to one small plant where the owner neglected to dispose of the manure properly. The third complaint related to an odor temporarily present when a compost pile was removed.—L. F. Conti, *Am. City*, 43, 6: 86-89 (Dec.), 1930. From *Pub. Health Eng. Abstr.*, Jan. 31, 1931. Abstr. C. R. Cox.

INDUSTRIAL HYGIENE

Gases in Manholes: A Survey of a Utility in Boston, Mass.—The investigation was made in the city of Boston and 19 other contiguous towns in coöperation with the Edison Electric Illuminating Co. of Boston. The survey extended over a period of 1 year during which 1,765 different manholes were tested and 4,068 individual tests made.

The workers were put to the task of devising special apparatus for testing the gases in manholes (this is described). In regard to odor as a guide, it was found that the smell test is positive in indicating rather large amounts of combustible gas, but it does not give any indication of the relative amounts present.

As a general average, 6 per cent of the manholes tested contained combustibles or sewer gas at one time or another. The majority of these were in the city of Boston; manholes in outlying districts were usually free from gas. Two districts in Boston had manholes in which the combustibles were above the upper explosive limit and represented especially dangerous conditions.

Carbon monoxide and hydrogen were present in all samples which contained combustibles in amount equal to 25 per cent of the lower explosive limit, on which complete analyses were made. It is, therefore, concluded that leakage of manufactured gas was the chief source of combustibles in the manholes during the survey. In no case was gasoline or other similar hydrocarbon detected.

Sewer gas was found in 9 samples. The amount of combustibles was always so low in these as to present no

explosion hazard, but on account of the low oxygen content such atmospheres would suffocate workmen who entered them without respiratory protection.

The results would indicate that it would be well worth while for utilities in other cities to conduct similar tests. —G. W. Jones and G. St. J. Perrott, *Report of Investigations*, U. S. Bureau of Mines, R. I. 3109: 1-16 (May), 1931. E. R. H.

Incidence of Miners' Nystagmus Among South Coast Coal Miners—While the examination of 500 South Coast miners was proceeding an opportunity was taken to determine the incidence of nystagmus among these men, to test out various methods described for its detection, and to find the value of the different methods with a view to forming standards of disability for compensation purposes.

It may be stated here that the incidence found was similar to that described by European investigators while certain of the more recent observations of Ohm on this subject were confirmed. —Charles Badham *et al.* (see previous abstract). E. R. H.

Sanitary Drinking Facilities with Special Reference to Drinking Fountains—The pamphlet contains recommendations for drinking water service stressing the importance of the type of drinking facility used, the standards of national agencies for the design of sanitary drinking fountains, and the various state laws, rules, and regulations pertaining to drinking facilities in places of employment.

One chart illustrates the state regula-

tion in regard to the prohibition of the common drinking cup in places of employment and a second chart, similar laws, regulations, and recommendations concerning the problem up to April, 1930. A selected bibliography accompanies.—Marie Correll, *Bulletin No. 87*, Women's Bureau, U. S. Department of Labor, 1931, 26 pp.

Division of Occupational Diseases, Connecticut State Department of Health—The Division has been granted a budget of \$32,152 for the biennium 1931–1933, and an additional chemist has been added to the staff, which now consists of a director, medical doctor; engineer to make surveys and technical determinations of work-room environment in the field; physical chemist for laboratory determinations; secretary; and well equipped laboratory. Additions may also be made as occasion requires. E. R. H.

The Carcinogenic Potency of Mineral Oils—In the process of manufacture of refined shale oil, the most potent fraction tested was found to be the unfinished lubricating oil. The refined oil was somewhat less potent, while the cruder products were on an average about 60 per cent less potent.

Samples of refined petroleum lubricating oils obtained from various fields of the world had widely different degrees of activity. A sample of Venezuelan oil was very potent, while Russian and Pennsylvanian samples were on an average less than one-tenth as active. Many other oils had an intermediate activity. However, two oils from the same area may have widely different activity, probably having come from different fields or having been more thoroughly refined with acid. For example, two Texas oils gave us potencies of 1 and 30, respectively.

As a rule the heavier grade oils tested were found to be less potent than

spindle oils. The amount of acid used in refining may account for the difference.

The addition of lanolin or sperm oil materially lessened the carcinogenic activity of the oils; in two cases 10 per cent lanolin reduced the potency 89 per cent.

Several saponifiable oils tested showed no carcinogenic activity; with regard to mineral oils, it appears that in general terms, the more saturated the constituent hydrocarbons the less capable were they of inducing cancer in experimental animals, the physical characteristics being similar.

The fluorescence of oils may be related to their potency. We have examined chrysene and found that, although very little soluble in the diluents used, it had a definite carcinogenic activity.—C. C. Twort and J. M. Twort, *J. Indust. Hyg.*, XIII, 6: 204–226 (June), 1931. E. R. H.

Cottonseed Oil (Milling and Refining)—The present scope and economic status of the cottonseed oil industry is given in statistics with a discussion of the types of workers and working conditions and a description or classification of jobs with their potential health hazards.

Among these are to be noted especially dust (silica being an important one), skin irritants with their corresponding skin diseases, and gossypol, a toxic body contained in cottonseeds which may be harmful through skin contact. (Illustrations accompany.)—Retail Credit Company, *Industry Report*, 6, 8: 85–94 (Aug.), 1931.

Trichlorethylene, Its Properties and Uses—In 1925, the company below named began the manufacture in this country of trichlorethylene, a solvent which has been produced in Europe for over 20 years. Of late years greater interest has appeared in this direction.

The physical and chemical properties,

specifications, principal uses and applications of the substance are given in detail. Supplementing these data, considerable space has been devoted to the present-day methods of use, such as fat and oil extraction (as from caffeine and nicotine), edible and inedible oils, bones and leather, the purification of explosives, and in analytical work.

The substance is also used in degreasing, degreasing processes, dry cleaning of textiles, wax removal from mineral oils, as a refrigerant, insecticide and fumigant, etc. It may also be mixed with certain other solvents, especially benzol and naphtha, certain precautions having to be taken.

As to physiological properties, from available evidence, trichlorethylene is not cumulative in its effect on the human system and produces no permanent impairment of health as a result of ordinary exposures to its vapors. Excessive exposure may produce intoxicating effects. These, however, disappear quickly on access to fresh air, since "Tri" is rapidly eliminated from the body. So far as relative toxicity is concerned, it is less dangerous than chloroform and many other chlorinated hydrocarbons and a number of petroleum solvents.

During the 6 years in which "Tri" has been manufactured by the present company, there is no record of any workman being so affected by its vapors that he found it necessary to obtain first aid or medical assistance.

Regardless of the comparative physiological action of different solvents, the equipment in which these solvents are to be used should be scientifically designed and built so that the health of operators is not endangered. Since small leakage or loss may occur even in the best designed plants, it is well to know the relative toxicity of different solvents, as indicated in various toxicity tables. These tables are based on reliable data but they all suffer from one

drawback—there is no consideration of the human element. If any one of them is handled in a negligent manner, the health hazard is increased tremendously. The relative toxicity of various solvents including "Tri" is given in an Appendix to the present work.—The Roessler & Hasslacher Chemical Company, Empire State Building, New York, N. Y., 1931, 38 pp. E. R. H.

Benzol (Benzene) Poisoning—

This is a new investigation of the toxicity of benzene and benzene impurities. A concise statement is made covering the history, chemistry, and industrial uses of benzene, acute benzene poisoning, chronic benzene poisoning, benzene dermatitis, and the medico legal aspects of such poisoning.

New experimental work with benzene is discussed in considerable detail, including a highly purified product, the toxicity of impurities and of homologues of benzene. Protocols of animal experiments, charts and comments constitute the chief body of the monograph.

Experimental work has clearly demonstrated toxic manifestations from all benzenes used, the lesions simulating those known to characterize benzene poisoning in man. Highly purified benzol is no less toxic than any other variety studied, and has produced a higher death ratio than any other benzene. No differences in manifestations among animals have suggested different types of lesions resulting from different grades of benzene. Such lesions as have been obtained have been relatively uniform. Benzene is in itself a toxic entity. All evidences of toxicity from benzene solutions containing rubber or similar sulphur bearing substances are to the effect that the benzene content is solely responsible.

Contrary to the usual beliefs, leucopenia does not invariably accompany benzene poisoning, and even severe poisoning may exist in the presence of

normal or above normal numbers (below 5,000). Single counts are of restricted value. A sustained leucopenia in suspected benzene poisoning is of diagnostic value, but in itself is not pathognomonic.

In the examination of tissues, two lesions stand out as of special significance: (a) nephritis with a special point of attack in the convoluted tubules, though not necessarily limited to them, but so unlike the usual nephritis as to constitute diagnostic evidence; and (b) hypertrophy of the stomach, most observable in the pyloric region. Acute ulcers have been observed, principally on the greater curvature near the cardiac end in the stomach (rabbits). Infections play an important part in determining fatality in benzene poisoning in rabbits, and, while several animals died from benzene poisoning itself, it is thought that infection is more than a terminal process in this form of poisoning.

Studies were likewise made of the toxicity of impurities of benzene, viz., acetonitrile, thiophene, amylene, methyl disulphide, and carbon bisulphide. Rabbits were again employed as the test animals. All chemicals were administered through inhalation. With respect to these, the results do not provide any evidence tending to place the burden of benzene toxicity upon its impurities.

The relative toxicity of 14 homologues of benzene, the principal ones being toluene and xylene, is commented upon and experimental evidences adduced to support the current belief that wherever practical toluene and xylene should be substituted for benzene because of lessened general toxicity.

Several pages are devoted to methods for the determination of benzene in the form of vapors admixed with air, likewise a section on the treatment of benzene poisoning and another upon practical protection. An exhaustive bibliography accompanies.—Carey P. Mc-

Cord and collaborators, mimeographed monograph, Industrial Health Conservancy Laboratories, Cincinnati, 1931, 78 pp.
E. R. H.

Butchers' Dermatitis—From the author's summary:

Butchers' dermatitis, characterized principally by erythematous areas on the hands followed by the appearance and subsequent eruption of pinhead vesicles, and accompanied by considerable itching as a symptom, is an occupational disease largely affecting butchers and inspectors who handle freshly killed carcasses.

The lesions, which first appear on the webs of the fingers and spread to the sides and backs of the fingers and to the backs of the hands as far as the wrists, may extend up the arms as far as the elbows, and in exceptional cases may spread to other parts of the body such as the chest, abdomen, legs, and face.

The affection does not appear immediately upon the exposure of susceptible persons, but usually makes its appearance after an initial period of exposure varying from 3 to 30 days, during which time susceptible persons presumably become sensitized to the tissues and fluids of swine, cattle, and sheep.

While certain persons make a rapid recovery following the first attack, with or without treatment, others develop repeated attacks while the exposure to the inciting cause is continued; in some persons the susceptibility lasts for several years. The available evidence indicates that many seasoned workers lose their susceptibility to this affection in the course of time.

While most susceptible persons appear to become fairly equally sensitized to the various classes of meat food animals that are slaughtered in abattoirs, certain persons exhibit a specific susceptibility to one or two classes of these

animals and are unaffected by contact with others.

The dermatitis may be checked by various local applications commonly used in treating related skin troubles in which there are no constitutional symptoms.

On the basis of available evidence, frequent washing of the hands in cold running water, thorough scrubbing of the hands with soap and brush at the end of the day's work, and coating the hands with vaseline or other ointments before beginning the day's work are, in most cases, effective prophylactic procedures.—Benjamin Schwartz, *J. Indust. Hyg.*, 13, 7: 233–243 (Sept.), 1931.
E. R. H.

Observations on the Working Capacity of Coal Miners in Relation to Atmospheric Conditions—From the authors' summary: The influence of atmospheric conditions on working capacity was measured by noting the duration of rest pauses taken from work. Observations were made on 304 men for an average period of 97 minutes each, or for a total of nearly 500 working hours.

The amount of time taken for rests was more closely associated with the dry bulb factor than with the wet. The association between rest pauses and atmospheric conditions is not a very close one, and does not enable one to forecast what amount of rest any particular miner, or small body of miners, would take under given atmospheric conditions. There are evidently other factors which have a more powerful influence on production than atmospheric conditions, which might nullify the good effects of any improvement in these conditions.

Neither the relative nor the absolute humidity of the air seems to have any definite effect on the amount of time

taken for rests when the dry kata cooling power is kept constant.

The observations suggested that in a hot, dry mine, working conditions might be improved by the use of artificial humidification. An experiment in this method of air conditioning was carried out, but owing to certain unforeseen and unavoidable circumstances, the results were, practically speaking, completely negative.

It is concluded that if the relative influences of the dry and wet bulb factors on working capacity are to be accurately assessed, the matter must be investigated under laboratory conditions.—T. Bedford and C. G. Warner, *J. Indust. Hyg.*, 13, 7: 252–260 (Sept.), 1931.
E. R. H.

A Study of Dysmenorrhea at the Home Office of the Metropolitan Life Insurance Company—Author's summary:

1. Severe cases of dysmenorrhea (congestive and infantile type) can be improved, and about 50 per cent can be cured.

2. The best results are obtained by using daily both the Mosher and setting-up exercises.

3. Constipation plays a large part in causing dysmenorrhea and necessitates careful regulation of diet.

4. Psychologic factors, such as self-discipline, also play a part in treatment for dysmenorrhea.

5. There has been a considerable saving in time lost, both from absences from work because of dysmenorrhea and from visits to the rest rooms at the Home Office of the Metropolitan Life Insurance Company, through the treatment of severe dysmenorrhea and through watchful supervision of the milder cases.—Ruth E. Ewing, *J. Indust. Hyg.*, 13, 7: 244–251 (Sept.), 1931.
E. R. H.

FOOD, DRUGS AND NUTRITION

Relation of Manganese to the Nutrition of the Mouse—While observations indicate a wide distribution of manganese in the vegetable and animal kingdom and it is definitely shown by recent work that manganese plays no rôle in hemoglobin formation, it is concluded that it does have a definite physiological action, perhaps in connection with reproduction.

The authors have found it possible to make preparations of casein, sugars, salt, vitamins A and D, practically manganese-free but in view of the difficulty of securing manganese-free vitamin B complex, resort was had to milk which contains approximately 0.02 mg. Mn per liter.

Mice were the experimental animals in order to conserve the supply of manganese-deficient foods.

Stock females were transferred to individual, raised, screen cages before the young mice were born and every precaution taken against contamination of any food material with manganese during the weaning period. After weaning, the young mice were divided into two groups, one receiving milk supplemented with 0.15 mg. iron and 0.01 mg. copper daily, and the other the same diet with addition of magnesium chloride to supply each mouse with 0.01 mg. of Mn daily.

In some instances, the milk ration was supplemented by a practically manganese-free mixture of lactose, butter oil and casein. With these diets, the growth curves indicate that the manganese had a definite effect on growth. As a typical result, in the case of 2 females from the same litter after 7 weeks on the experimental ration, 1 mouse weighed 19.1 gm. and the other on the

manganese-free diet weighed 12.7 gm.

A study of the ovulatory rhythm shows that manganese is closely connected with the reproductive organs. In the case of the mice receiving no manganese, in only 1 mouse out of 5 did the estrus cycle make its appearance—then only twice. With manganese during the same period of observation, the number of estrus cycles increased from 3 to 8 and 1 mouse gave birth to 5 young when 134 days old. The frequency of the cycles in the manganese group appears to be approximately normal. While it is concluded that manganese has a distinct influence on the ovarian activity, no opinion is expressed as to the mechanism of this action.—A. R. Kemmerer, C. A. Elvehjem, and E. B. Hart, *J. Biol Chem.*, 92: 623 (Aug.), 1931.

Effects of Deprivation of Manganese in the Rat—As a preliminary to the study of the deficiency of manganese in the diet, it was necessary first to provide an adequate diet of manganese-free food materials. By the spectrographic method of examination of a wide variety of foodstuffs, the following food dietary factors were found practically manganese-free: starch, sucrose, casein, butter fat, vitamins A, D, and E, sodium chloride, calcium lactate, and K_2HPO_4 , NaH_2PO_4 and $CaH_4(PO_3)_2$.

Essential dietary factors such as supplementary proteins, vitamins B and G, an iron salt, and a magnesium salt not available in a manganese-free condition were prepared by methods devised by the authors so as to be practically manganese-free. The vitamins and supplementary proteins were prepared by ex-

tracting yeast in 50 per cent alcohol and the iron and magnesium salt were the hydroxides.

Four different diets were given the young rats: first, the diet manganese-free; second, the control containing the substances with the natural content of manganese; third, manganese-free ration plus 0.005 per cent manganese as $\text{MnCl}_2 \cdot 4\text{H}_2\text{O}$, approximating the average amount in animal and vegetable tissues; and, fourth, manganese-free diet plus 0.05 per cent manganese. All diets contained 15 drops per kilo of Viosterol. All precautions were taken to prevent contamination of animals or cages with manganese.

On all four diets, young rats grew to maturity and those on the manganese-free diet did not differ materially from well nourished rats on a diet continued 7 months or more. The organs of the rats on the manganese-free diet as well as the new-born rats and rats 15 days old of mothers on the manganese-free diet showed no manganese. Manganese is present both in the organs and in the bodies of young rats on normal diets, indicating transmission of manganese through the placenta.

Absence of manganese did not interfere with hemoglobin formation, nor was the addition of manganese able to effect hemoglobin regeneration in the case of experimental anemia. Females on the manganese-free diet appear to have normal estrual cycles and normal litters when mated with normal males. The females, however, failed to suckle the young in 58 out of 59 cases. The same females when given foster young from known litters failed in 8 out of 10 cases to suckle them.

Females from stock colonies showed little interest in the young of manganese-free mothers, although 7 out of 107 manganese-free young were so reared. These were undersized in spite of having secured the necessary food. Male rats show no abnormality until about

the 100th day when testicular degeneration appears with progressive atrophy until complete sterility results. Sexual potency in the male was restored by the addition of manganese to the diet.

The authors conclude as a result of similar clinical evidence in human subjects that manganese is essential to the production in the hypophysis of a hormone which regulates the function of the testes in the male and the mammary tissue in the female.—Elsa R. Orent and E. V. McCollum, *J. Biol. Chem.*, 92: 651 (Aug.), 1931.

Beneficial Effects of Fat in High Sucrose Diets when the Requirements for Antineuritic Vitamin B and the Fat-Soluble Vitamin Are Fully Satisfied—These authors reported previously (*J. Biol. Chem.*, 83: 269, 1929) that the presence of dietary fat reduces requirements for the antineuritic vitamin. This work was undertaken to determine whether diets improved by vitamin B can be further improved by additional fat.

Female rats, 21 days old, reared in individual cages on raised wire screens, were the experimental animals. The fat-free diet consisted of specially treated casein, autoclaved yeast, sugar, and salt mixture. The fat diets were on the basis of 25 per cent fat with adjustment of sugar and casein levels to maintain approximately the same nutritive ratio. The fats were lard, coconut oil, synthetic cottonseed and synthetic coconut oil. The synthetic fats were prepared by saponification of the natural fats and esterification of the fatty acid with redistilled glycerol.

Brewer's yeast, ether-extracted wheat germ and rice germ, and alcoholic extracts of rice bran and rice polish were used as sources of vitamin B.

Three experimental series are recorded. In each of these vitamin B was fed at many times the level for the requirements of the rat. In the first

experiment, growth of animals on the fat-free diet was inferior to the diet containing 25 per cent of lard, although both were supplemented with vitamin B from the wheat and rice germ and with the extracts of rice bran and rice polish.

This series disclosed the fact that rats on the normal stock diet were definitely inferior to those receiving the fat supplement and not superior to the fat-free diet.

In the second series, the 25 per cent fat component was synthetic cottonseed oil. This series shows beneficial effects of the diet in those cases where the vitamin B supplement was brewer's yeast or rice polish extract.

In the third series, with rice bran and rice polish extract as vitamin B additions, the rats receiving the natural coconut oil and lard adjustment were superior to those on the fat-free diet. The series in which the animals received a high supplement of rice bran extract was allowed to run a year, and while the animals on the fat-free diet showed no marked deficiency at the end of this time, they were definitely inferior to those receiving fat as is evidenced by coarser fur, tendency toward skin dryness, and lower body weight.

The authors conclude that the improvement is not due to fat-soluble vitamins as the same improvement was shown by synthetic fats and that vitamins A, D, E and F were abundant in all diets.—Herbert M. Evans and Samuel Lepkovsky, *J. Biol. Chem.*, 92: 615 (Aug.), 1931.

Distribution of Manganese in Foods—It was the aim of this investigation to supplement data already reported. The procedure given by Davidson and Gapen (*A. O. A. C.*, XII: 310, 1929) was followed in the analyses of samples containing 0.1 mg. or more of manganese, while foodstuffs containing very small amounts of manganese were analyzed according to the modification

reported by the authors in the *Journal of Biological Chemistry* (88: 347, 1930).

The manganese content of 83 representative food materials is given. The concentrations range from 0.028 mg. per liter of milk to 49.9 mg. per kilo of bran flakes. Thirty-six of the materials contained less than 1 mg., 25 contained from 1 to 5 mg., and only 22 more than 5 mg. per kilo of fresh material.

Arranged in descending order with respect to their manganese content, 12 classes of foods representing 138 food materials appear as follows: nuts; cereals and their products; dried legume seeds; green leafy vegetables; dried fruits; roots, tubers and stalks; fresh fruits; non-leafy vegetables; animal tissue; poultry and poultry products; dairy products; and fish and sea foods. Since blueberries were found to contain such an enormous amount of manganese (314.9 mg. per kg. dry basis) the average for fresh fruits was given both with and without the blueberry value. In typical American diets, cereals and their products contribute the largest proportion of the manganese intake.—W. H. Peterson and J. T. Skinner, *J. Nutrition*, 4: 419 (Sept.), 1931.

Absorption of Aluminum Compounds—The absorption and retention of aluminum were studied in a group of rats which were raised from weaning to maturity on a diet which contained 0.6 per cent of aluminum chloride, which is equivalent to 600 p.p.m. of the element aluminum.

After 3 months 6 rats were killed, at which time they had more than quadrupled their weight. A table shows concentrations of 0.2 to 1.0 p.p.m. of aluminum in the liver, kidneys, spleen, and testes or ovaries of rats raised on diets containing 600 p.p.m. of aluminum as compared with 0.05 to 1.0 p.p.m. the concentrations of aluminum previously found in the same organs of rats raised

on standard stock diets. This shows a difference so small as to warrant the conclusions that aluminum present in the diet is not absorbed and deposited, as has been contended by Underhill *et al.* (*Am. J. Physiol.*, 90, 1929).—Dee Tourtellotte and O. S. Rask, *Am. J. Hyg.*, 14: 225 (July), 1931.

Effect of Vitamin B Deficiency upon the Vitamin A Reserves of the Rat—It has been previously shown (*Biochem. J.*, 25: 275, 1931) that when rats are given diets rich in carotene, vitamin A may accumulate in the liver in amounts that seem great compared with the minimal daily requirements. This is a report of a further study of the effect of vitamin B deficiency upon the vitamin A reserve of the rat.

The experimental animals used were adult albino rats which had been reared to maturity on a complete synthetic diet and subsequently maintained for about 200 days upon a diet rich in carotene. Under these conditions the vitamin A reserves of the liver had been found to be remarkably constant between individuals. The rats were then exposed to diets deficient in the vitamin B complex until severe emaciation resulted, after which post-mortem examination was made both as to the extent of the remaining body fat and the amount of vitamin A still contained in the liver oils.

Rat 1 was used as a control and was

kept on the complete red palm oil diet.

Rat 2 was transferred from the complete diet to one deficient in vitamin B complex which still contained red palm oil (Glaxo caseinogen 20 per cent, cane sugar 60 per cent, salt 5 per cent, red palm oil 15 per cent). On this diet the rat declined rapidly and died after 48 days. Post-mortem showed complete absence of fat depôts and general emaciation.

Rat 3 was transferred from the complete diet to one similar to that given to rat 2 except that arachis oil replaced the red palm oil, making the diet completely free from vitamins. After 35 days the rat, being extremely emaciated, was killed. Post-mortem examination revealed that the remains of the fat depôts were very scanty.

Rat 4 received the same diet as rat 3 but was killed after a longer period. There was a complete absence of intraperitoneal fat. Analyses were made separately of the liver, the intestinal tract and contents, the pelt and the remainder of the carcass.

From the results reported, it is evident that the high reserves of vitamin A which the rat is able to store in the liver when fed on a diet rich in carotene are not depleted when it is concurrently or subsequently suffering from lack of the vitamin B complex in spite of the severe drain on the body fat.—William John Dann and Thomas Moore, *Biochem. J.*, 25: 914, 1931.

CHILD HYGIENE

HEALTH OF THE SCHOOL CHILD

CHILDREN, at the time of school entrance, are very unequally conditioned physically, mentally, and emotionally. This difference arises primarily from hereditary factors, modified by social environment, nutrition, infections, and various handicaps due to accident or disease. The school has assumed that its primary function is to detect the mental differences in children and provide for their formal education in either graded or ungraded classes. This assumption is a hang-over from the old classical conception of education, namely, that the mind was the first consideration of the school and the body an encumbrance. We know now that mind and body are intimately related and that the whole child should be the concern of school authorities.

It is futile to try to force upon children the education provided by the school if handicaps, physical or mental, exist; if, for example, the child is so poorly nourished as to be hyper-excitable or easily fatigued, his mind cannot be receptive.

Ideally, there should be a progressive health program for the child from his prenatal life right to time of school entrance. If we could open the way for applying to the preschool child the technics we know would be effective, the school would be relieved of a great deal of its difficulty in classifying children and looking after defects at school entrance. Our best efforts should be concentrated upon the preschool child in order to prepare it properly for school. While the school may, in self defense, promote preschool examinations to detect defects, it is really the function of the local health department to follow all children who go to child health centers,

until they enter school. It would be ideal if the completed health record of the child could accompany it right into the school. This is too much to expect, probably, in an age when migration is so constant. It is even more difficult to keep track of the preschool children than of school children.

There are, however, certain protective measures which should be carried out thoroughly for the preschool child. Vaccination against smallpox and immunization against diphtheria should be done by all means before school entrance. An unprotected child population is especially susceptible to smallpox, and it has been stated that 58.5 per cent of the deaths from diphtheria occur under 5 years of age, and 86.5 per cent under 10 years.

At this season many city health departments are issuing pamphlets regarding the health of the school child and pointing out the necessity of a thorough physical and mental examination at school entrance. A recent bulletin of the Minneapolis Division of Public Health¹ sets forth this problem of the school entrant. It states:

The three essentials every child must have for satisfactory progress in education are: proper vision, good hearing, and the growing ability to think. Whatever interferes with these three cardinal functions results in either breakdown or unnecessarily laborious effort.

The correction of existing faulty conditions, such as bad teeth and poor tonsils; the proper treatment of functional conditions such as poor nutrition, unstable nerves, and simple heart disturbances calling for the teaching, by precept and example, of proper health and social habits should not be delayed until the kindergarten age is reached. The protection of the individual against the liability to infections tending toward the establishment of disease processes may be met by such preventive measures as timely vaccination and

inoculation properly performed during the first or second year of life. If these precautions have been neglected until the kindergarten age is reached, it should be a matter of grave concern and of rectification then. Contagious diseases leave their mark upon the growth and structure and functions of the child, and frequently are handicapping millstones, dragging the child down into the mire of incomplete productiveness throughout his entire life.

In its report, *Communicable Disease Control*, a committee² of the White House Conference on Child Health and Protection pointed out that:

School children are the group most easily reached. The school was at one time regarded as a place of opportunity for children to contract disease. It is now known that a school with proper health supervision, ordinarily, is one of the safest places for the child.

The committee recommends early immunization against smallpox and diphtheria and, as general control measures among school children, the following:

1. Morning inspection of every child by nurse or teacher who is familiar with ordinary signs of disease
2. All suspects referred to the school physician, local health officer, or family physician for diagnosis
3. Exclude suspects and recognized cases until certified by competent authority as safe to return

A matter of prime importance during the present depression is the strengthening of child labor laws and the rigid application of their provisions. This is closely related to the school health problem. The National Child Labor Committee³ points out that:

Cutting short children's schooling for work benefits no one. It not only limits their edu-

cation but may impair their health. The competition of children in industry, moreover, tends to depress wage rates, lower standards of living, and aggravate unemployment. Even in the year 1930-1931, with millions of adults unable to find work, in 23 states and some additional cities reporting to the U. S. Children's Bureau, permits were issued to 103,000 children 14 and 15 years of age to enter industry.

It is also of great concern that this same committee is obliged to report:

Most children under 16 are so immature and reckless, so easily fatigued, and have such poor muscular coördination that no industrial employment, no work in the vicinity of machines, even when they do not themselves operate them, no employment in transportation, is free from hazard. Thousands of 14- and 15-year old children are injured in industry every year, some of them being killed or maimed for life. The only effective safeguard is to prohibit all industrial employment under 16 years.

To prevent this costly toll of industrial accidents, burdensome to industry as well as to the injured children, laws must be enacted with the support of public opinion which will keep all children under 16 years of age in school, and which will prohibit the employment of minors between 16 and 18 years of age in dangerous occupations. Such a course would serve the triple purpose of assuring to our young people a fully-rounded education, safeguarding them against industrial injury, and relieving the pressure of child competition in the employment market.

REFERENCES

1. *The Commonwealth Bulletin*, published under auspices of The Minneapolis Division of Public Health and The Health Council of the City of Minneapolis and the County of Hennepin, IX, 3 (Sept. 15), 1931.
2. Committee on Communicable Disease Control, Section II—Public Health Service and Administration, White House Conference on Child Health and Protection. *Communicable Disease Control*, 1931, pp. 9 and 96.
3. Press Release during September, 1931, National Child Labor Committee, New York, N. Y.

PUBLIC HEALTH NURSING*

Over the Top with the A. N. A.—In 1896 a little group of far sighted nurses organized themselves into the American Nurses' Association. In January, 1931, their membership numbered 86,000 when they launched a drive for 100,000 members. Early in September on the thirty-fifth anniversary of their organization at the end of the drive there were 105,000 members. This is probably the largest professional organization of the women of one country in the world.

Effectively functioning state associations in every state of the Union, in the District of Columbia and in Hawaii and Porto Rico give evidence of thorough organization. Janet Geister, Director of the American Nurses' Association, says:

But organization is only a prelude to program. What cannot a hundred thousand nurses do! For 5 years we have been making a self study to find our true status. The first step in shaping a program has been accomplished. The diagnosis has been made. We know pretty well what our problems are. The next step is treatment. What are we going to do about it? and who shall do it? We look to the national organization for guidance and leadership. But it is the local groups, close to actual conditions, who must do the work. In the national office, plans are under way now for making practical suggestions for activities in state and district and alumnae groups during the coming year. Nursing problems are universal. They differ locally only in degree. The national office is a clearing house through which emanate committee and board actions, standards, objectives and programs. In the heart of the individual nurse lies the answer to the future of nursing. The American Nurses' Association is built out of the heart of the nurse herself

working in her alumnae district and state—a glorious task, for we are meeting human needs.

—*Bull.*, American Nurses' Association, Sept., 1931.

N. O. P. H. N. Membership Drive—The increasing demands constantly being made on the special committees of the National Organization for Public Health Nursing which make studies of costs, staff education, statistics, mental hygiene, school and industrial nursing, etc., as well as additional requests for different kinds of institutes, have made it extremely necessary for the organization to extend its membership to make all these services more widely available.

It is estimated that fewer than one-fourth of all the public health nurses in the country are members of the N. O. P. H. N., and since the services of the organization cannot be duplicated by any other agency, not only every public health nurse, but every lay person interested in health conditions throughout the country should give his or her support.

Mary Sewall Gardner is chairman of a Membership Committee now being organized. The campaign starts in October and will end at the biennial convention in San Antonio, Tex., next April.—N. O. P. H. N. *News Release*, Oct. 1, 1931.

A Twenty-one Months' Coöperative Course in Public Health Nursing—This course is offered jointly by the School of Applied Social Sciences of Western Reserve University and the Cleveland Visiting Nurse Association, beginning this fall. It covers the regular 9-months program for the first year, followed by appointment to a junior staff position with the visiting nurse as-

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex, Indianapolis, Ind.

sociation; it is planned for nurses who want to begin preparation for public health nursing immediately after graduating from training schools; they are given a time allowance for advanced study. In the second year there is a required seminar in public health nursing each semester, and one elective course to be chosen from the regular curriculum.

The school still continues to give an elective in rural nursing for well qualified students. This includes 3 months of rural field experience and also courses in rural sociology and rural government. The Board of Health of Lorain County, with headquarters at Oberlin, O., is co-operating with the school in giving this course (Nurses as Social Workers, *Survey* (Midmonthly), Sept., 1931, p. 556).

Public health nursing leaders will watch this experiment with interest, as they have felt that students graduating from the 9-months public health nursing courses needed staff experience before launching out for themselves; yet they were just as conscious that those nurses with staff experience alone needed a theoretical course. The new Cleveland course ought to be just the preparation we are all desiring for public health nurses.

Board Education 1931-1932—The representative of public health nursing board members on the staff of the N. O. P. H. N. is constantly asked while in the field how to educate board members, how to inform new committee members about the work and their responsibilities, and what the new trends are in public health nursing. These lay people, responsible for carrying on and promoting the work of public health nursing associations, know they cannot make a real contribution unless they are well informed.

To meet this need the Board and Committee Members' Section and the staff of the N. O. P. H. N. have out-

lined two courses of study, which take the form of two series of discussion topics—one for board members of urban public health nursing organizations; the other for rural or county committees.

There will be 8 topics and on the first of each month your president or chairman of the education committee, or some other person whom you designate as responsible for this program, will receive the subject for study with suggested readings and questions raised for discussion. Our hope is that the education committee will take this topic, read the references, work up a short résumé of the material and present it at board meeting, raising some of the questions for discussion, letting others come from the floor. Do not pass this job to the nurse director to do for you! She will be at the board meeting to aid in the discussion and handle the professional angles which we as lay people do not always know about or understand, but let us do the preparation ourselves. The whole trend in modern education is toward individual study and we all know that the thing we have read about or looked up for ourselves will become a part of our knowledge more readily than if some one else does the work for us.

The topics chosen for eight months are as follows:

FOR CITY PUBLIC HEALTH NURSING GROUPS

1. Generalized public health nursing programs
2. Standards and qualifications for public health nursing positions, staff education, further opportunities, etc.
3. A community health program
4. Relationship to medical profession
5. Tuberculosis nursing
6. Social hygiene as a part of a public health nursing program
7. Industrial nursing
8. Records, statistics and analysis of costs

FOR COUNTY AND RURAL GROUPS

1. A health survey of your community
2. The State department of health
3. Full-time county health units
4. Public health nursing—history and present standards and developments
5. Rural sanitation
6. Maternity, infancy and preschool program

7. School health
8. Communicable disease control—tuberculosis and venereal disease

Board members interested in receiving this series of topics to study this winter write to Evelyn Davis, National Or-

ganization for Public Health Nursing, 450 Seventh Avenue, New York, N. Y. —Board Education 1931–1932. Board and Committee Members' Forum, *Pub. Health Nurs.*, XIII, 9: 447, 448 (Sept.), 1931.

EDUCATION AND PUBLICITY*

Lantern Slide Making—Poor lantern slides are usually worse than no slides at all. Add skill in photography to a knowledge of slide technic and the result should be photographically good slides. The "know how" is supplied by *Lantern Slides: How To Make And Color Them*, issued free by Eastman Kodak Company, Rochester.

The use of lettering calls for future discussion, but the maker of the too well known "advertising slide" cannot be trusted to produce an educational slide without detailed supervision. No one in the health field would allow a printer to lay out a page with the weird combination so common in advertising slides—several families of letters, irregular arrangement, irrelevant ornament (usually not ornamental), several colors (sometimes harmonious), all thrown together to make a picture puzzle. If not acceptable in printed form, how can we approve such material when displayed only for a few seconds?

Born: November, 1921—Ten years ago this month the first sessions of the present Public Health Education Section were held as part of the New York meeting of the A. P. H. A.

The thanks of the Section are due to the then executive secretary, A. W. Hedrich, who invited Mr. and Mrs.

Routzahn to organize two sessions on health education and publicity. The *JOURNAL* for April, 1922, gave fairly full reports of these sessions on the topics: "Motion Pictures" and "How to Further Progress in Health Education and Publicity."

Familiar names appeared in the lists of speakers: Turner, Osborn, Ellis, Meyer, Kleinschmidt, Jacobs, Snow, Dinwiddie, Dealey, Rickards, Marcus, Evans, Miss Rose, Mrs. Routzahn; with Evart G. Routzahn serving as chairman.

At that time Dr. Lee K. Frankel was elected the first chairman of the new section which lived for several years on a provisional basis, and then was given permanent status.

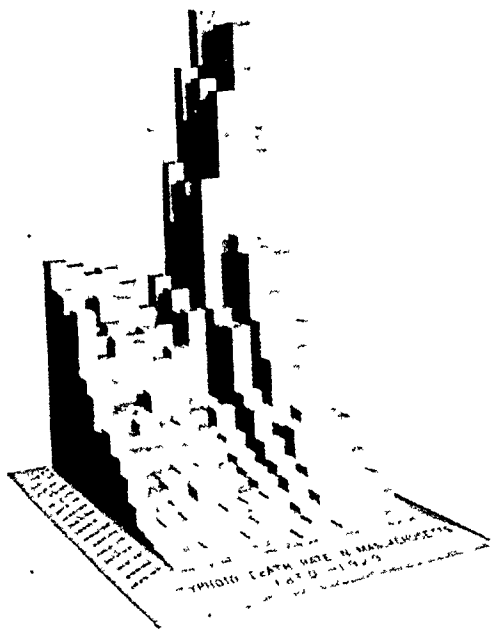
Less than 10 years after the first sessions in New York the Section was reported at Montreal to have 339 members and 44 fellows—and 10 fellows were elected in September. We are growing up.

Models, Flashing Lights and Pictures—How much there was to study at the annual meeting of the A. P. H. A. is emphasized by the record below of the displays at Health Education and Publicity Headquarters under the auspices of the Public Health Education Section.

Three solid models showing the trends in tuberculosis, diphtheria, and typhoid death rates in Massachusetts over the last 75 years. . . . They clearly illustrate in an interesting

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

manner the application of the three-dimensional graph in public health education. (Exhibited by Harvard School of Public Health.)



Copies of annual health department reports of cities, counties, and states, selected by the Sub-committee on Health Reports of the Committee on Administrative Practice of the A. P. H. A., as among the best of the year. Number of copies published, with costs, were indicated on the title pages.

Photographs of the new Deutsches Hygiene Museum of Dresden. The photographs show exterior and interior views of the museum building as well as of the vast number of wax, glass, and plaster models which it houses. They were loaned for this occasion by the Milbank Memorial Fund and by the Metropolitan Life Insurance Company, from the collection of the late Dr. Lee K. Frankel.

The White House Conference on Child Health and Protection exhibit of publications and charts.

How a health department cuts costs in the production of forms, sanitary regulations, reports, and monthly bulletins, was illustrated by the display of the Middletown, N. Y., Health Department.

"Something for idle minds in Clinic waiting rooms," exhibited by Cleveland Health Council, Ethel Hanson in charge. "Health Flashes" appeared as lantern slides or film strip, the one colored, the other uncolored.

You press a button and ring a bell, if you have selected the correct answer among four, of which only one is correct—on the Electric Questioner devised by the Racine (Wis.) Health Dept. The device is a picture frame

designed to hold and display a printed card bearing a question of public health significance, and four answers—of which one is correct and three represent current erroneous beliefs. Any number of question-and-answer cards can be arranged. There is a push-button opposite each answer, and a 4-point switch allows any button to be energized while the others remain "dead," thus allowing the correct answer to appear in any desired position. A door-bell and 110-6 volt transformer completes the wiring.

An album of photographs illustrating the Shanghai anti-cholera parade organized by Dr. W. W. Peter.

A collection of diphtheria educational material shown by Marie Kirwan of State Charities Aid Association, New York.

The Clean-Up Campaign (Cleveland Health Council), Early Diagnosis and Christmas Seal Campaign (National Tuberculosis Association), Smallpox Campaign (Racine Health Department).

Educational material by National Dairy Council and Metropolitan Life Insurance Company.

A classified collection of *Better Health* and leaflets reprinted from same, by Syracuse Department of Health.

A large portfolio, the original presentation of the work of the Detroit Health Department as its winning entry in the 1930 Inter-chamber Health Contest.

The Syndicated Health Bulletin of the A. P. H. A.

A series of classified portfolios (National Organization for Public Health Nursing) containing well selected examples of printed matter primarily for nursing organizations but of general interest to health workers.

The 10 portfolios of classified health education samples from departments and associations, and the 50 portfolios of helps and samples of examples of many types shown by Mr. Routzahn, chairman of the Education and Publicity Headquarters Committee.

In Windsor Hall—In addition to the above the main exhibit hall at Montreal contained numerous displays of interest to readers of this department. Among these were: American Society for the Control of Cancer, *Canadian Public Health Journal*, Metropolitan Life Insurance Co., *Municipal Sanitation*, National Dairy Council, Syndicated Health Bulletin (with John

Hall, of course), Victorian Order of Nurses for Canada.

Something To Do Something About—Past Chairman Howard Green when invited to write a "message" for this department naturally emphasized a point of view he sought to bring out in our 1931 program.

The second session of the Public Health Education Section at Montreal was designed to bring out a few of the simple facts known by other sections of the American Public Health Association and to demonstrate how these facts should be used to educate the public and to motivate it to action. Certain sections of the Association are primarily fact-finding; at least, the members of these sections are in constant touch with the newer demonstrated public health facts. Other sections of the Association are made up largely of persons whose chief duty it is to apply these facts in the demonstration of public health work.

The individuals making up the Public Health Education Section are chiefly concerned with aiding the producer of facts on the one hand, and the demonstrator or utilizer of facts on the other hand, and with getting the general public, various professional groups, and others, to recognize these fundamental facts and to respect and apply them for the improvement of individual health and the protection of community life. The Public Health Education Section therefore is allied with those who know the facts and those who individually and collectively promote their use for the benefit of public health. It is a well recognized fact that the general public knows more than it *does*. The health educator has a real problem in extracting the facts, in making them available, and in making the general public not only know them but recognize their value and apply them to their daily life and to the health of the community.

A State-Wide Publicity Kit—For some years the National Tuberculosis Association has prepared "publicity kits" for the Christmas Seal and Early Diagnosis Campaigns. These have included detailed plans and much ready-made material for local use.

Now there comes from the Oregon Tuberculosis Association, Fitzpatrick Block, Portland, a kit for the fall of 1931 for county units, county nurses, county public health associations.

This Educational Kit has been prepared as an aid to those interested in keeping the people of their county informed of the services and activities of their public health agencies.

The accompanying letter states the urgent need for more and better publicity which exists in many parts of the country:

We are all alive to the need for exceptional effort this fall to retain in county budgets the necessary appropriations for county and school physicians and nurses. Individual jobs as well as the service generally will be at the mercy of tax-reductionists this fall.

A more intelligent appreciation of the value of our county public health machinery must be instilled into the mind and heart of everyone if we are to stave off collapse in some communities. A comprehensive educational program reaching every corner of your territory is absolutely essential to bring this about. Some school and county nursing appropriations have already come under the knife.

The kit outlines a calendar for the fall months, suggesting statistical and other data illustrating the "wide range of the nurses' work," "services of volunteers," "results of services," and "cost of service."

Along with the above are specific suggestions as to the use of the material in newspapers, in talks, by handbills, charts, window displays, radio, etc.

Additional sheets suggest sources for securing data and help in preparing talks and writing copy; suggestions as to use of amateur movies and other special mediums; and offer three ready-made news stories with blanks for filling in local names and facts. A copy for 10 cents sent to the Oregon Tuberculosis Association.

Other state associations and departments would be inclined to provide a similar service if encouraged by requests from local workers.

They Need Help—The initiative for 1931-1932 in Public Health Education Section rests upon the new group of officers—but theirs is not the whole responsibility.

Chairman, Iago Galdston, M.D., 2 East 103d St., New York, N. Y.

Vice-Chairman, Elizabeth C. Nickerson

Secretary, Raymond S. Patterson, Ph.D., John Hancock Life Insurance Co., Boston, Mass.

Section Council:

Raymond Greenman (1932)

Evart G. Routzahn (1933)

Ira V. Hiscock, Ph.D. (1934)

John Sundwall, M.D. (1935)

Clair E. Turner, Dr.P.H. (1936)

Association Committees:

Fellowship and Membership Committee,
Homer N. Calver

Training and Personnel Committee, Mary
S. Routzahn

A Contest in Posture—Seeking a health education plan for awards to be made on their annual Tuberculosis Field Day, the Tuberculosis and Health Society of St. Louis conducted a posture contest. Charles A. Freck of the Society describes the plan in detail:

We secured in our own office building a suite of two rooms. The larger was divided, the front half being used for a waiting room and registration room, the rear part for a dressing room. Adjoining was the photographer's "studio." We constructed a shadow-graph 6 feet square of two sheets of architect's tracing cloth behind which was a bank of 100-watt bulbs. An ordinary photographer's camera was placed 12 feet in front of this screen. Three children stood between the camera and the screen and were photographed. Instead of photographic plates, we used bromide paper which gave us excellent results although we got only a single print.

Three days were allotted; the first for boys, the second for girls, the morning of the third for colored boys and the afternoon for girls. Some 50 organizations received a handbill announcement. The whole contest was planned and promoted in 3 weeks. One hundred and seventy-five children came. No colored children entered.

The photographs were identified by means of metal house numbers which were hung

above the child's head to correspond with the number placed on his registration card. After the paper was developed, photographs were separated and distributed among the examining committee of 4 physicians—2 pediatricians and 2 orthopedic surgeons—who selected the few children with the best posture. These children, 12 boys and 12 girls, were called back several days later and personally examined by the committee and the winners picked.

The back of the registration card read as follows: "I hereby give consent for the child named on the reverse side of this card to participate in the Posture Contest and agree to abide by the decision of the Judges." (Signed by parent or guardian.) This was done to eliminate criticism of the fact that the children were photographed stripped.

Silver loving cups were presented to the boy and the girl by a group of local dignitaries as a part of the Tuberculosis Day program, July 28. Each child was sent his photograph together with a chart showing excellent and bad posture and instructions for improving.

The contest was highly commended by all the medical men with whom we discussed it. We intend to give another next spring and should be able to get some interesting results therefrom. We are experimenting with other forms of photography in an attempt to get still better pictures at low cost. We wanted to keep each picture on file, the doctors wanted the pictures for reference and, of course, much of the educational value would have been lost had we not forwarded the pictures to the children, so we decided in favor of the latter. In the next contest we will use some process whereby we can get more than one print and hope to have at least 1,000 entrants.

Mr. Freck will send a copy of the chart given to the children—a letter size mimeographed sheet with 4 illustrations and simple educational material which can be used without a contest.

Important 10 Years Later—In the report of the Cleveland A. P. H. A. meeting—the first session of the newly formed Section on health education we note the following:

Dr. Lee K. Frankel, chairman of the section, in opening the meeting, referred to the need for stressing the positive message, not merely making people understand sickness and its causes, but also the value of health as such.

Where We Hope To Go—Encouraged by searching discussion among Public Health Education Section members at Montreal, Chairman Iago Galdston suggested 5 goals for 1931–1932:

1st: To contribute to the orientation in health education, by which I mean to tie together the numerous independent activities carried on, to help crystallize a policy and viewpoint and an accepted body of technics.

2d: To define better than it is at present defined the relation of our section to the others of the A. P. H. A.

3d: To render our section as useful as possible to health officers, nurses, teachers, sanitary engineers, epidemiologists, etc.

4th: To establish in conjunction with meetings of the A. P. H. A., an institute on health education.

5th: To help in arranging for the 1932 meeting of the A. P. H. A., a meaty and interesting program.

At Montreal But Not Members—

A lot of people in our Montreal sessions are not members of the Public Health Education Section. We need them. We believe they need us. Please check up on health workers in your city or state—and do something about it.

Since July, 1923—In that month's issue of the JOURNAL was the first "Education and Publicity" department, which has since continued with but two or three issues passed by.

How to Write for the Public—

Recently Dr. E. Stanley Abbot discussed the writing of popular pamphlets informally in a letter to Kathleen Larkin of the National Committee for Mental Hygiene. We quote Dr. Abbot:

Whoever is to write the pamphlets of this series should have

1. A rather vivid mental *picture of the public* to be reached by this particular series and by each particular pamphlet;

2. *Empathy*, imagination, a capacity to visualize the information, misinformation, and ignorance which the particular public will bring to the reading of the pamphlets, and be-

cause of that background, what that particular public not only *can* get, but probably *will* get from the pamphlets;

3. Sufficient *knowledge of facts* of mental hygiene;

4. A *sense of proportion* as between normal and abnormal;

5. A *flair* for writing simply, directly, in terms understanding of the people;

6. *Time* enough (a) to get the *facts* from those who have them, if the writer does not already have them; (b) to *weigh them* as to their mental hygiene value for the public they are intended to help; (c) to *consider beforehand* the probable effect of what the writer has in mind on the public he is writing for; (d) to *write carefully*; to *confer* many times and long times with others who know, concerning *all* these points, so as not to overlook any of the points that need to be kept in mind in writing such a series for a general public.

The general plan of getting out a series of pamphlets for the general public has, I think, almost unlimited *possibilities* for good, and so is well worth keeping at. Its *actualities* will depend upon how well its individual parts are done. I am glad you have come to see that the leading authors are not necessarily the ones to write the pamphlets. They would be if they would give the time, the thought, and the work necessary, but they won't. As you are coming to realize, each pamphlet requires a large amount of all three—time, thought, work—besides a fourth—information. Workers with concrete problems, like the teachers, have much information, and some among them are willing to give time, thought and work. But information in other fields which border theirs, and a broader outlook than they are likely to have, are also needed. That broader outlook *you* will have to have—you may have it yourself or may add to what you have by getting it partly from one person, partly from another, thus gradually building it up. I am only trying to give you my little bit to add to what you have. This broader outlook you can then contribute to these coöperators with you in the general plan. It takes time to get it over to them. But when got over, it will be worth much to them as well as to you for the pamphlet series.

All your coöperators have a great deal to learn. We all have. This is one of the troubles. We don't know as much as we need to know in order to write these pamphlets. So don't get discouraged if it takes time, and time, and time to get out even one pamphlet! To get out a really good one is worth it.

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Principles of Sewage Disposal—Bulletin No. 12—*Division of Municipal and Industrial Research, Massachusetts Institute of Technology, Cambridge, Mass.*

This is an 8-page booklet giving the principles of sewage disposal, starting with the necessity of sewage disposal, the classes of sewage, including industrial wastes, and the purposes of sewage treatment processes. The necessity of sterilization of effluent is covered and the extent of sewage treatment required is discussed.

An outline of sewage disposal processes discusses: (1) preliminary methods (screens, grit chambers, plain sedimentation and chemical precipitation); (2) intermediate steps (single-story septic tanks and Imhoff tanks); (3) final treatment (broad irrigation, intermittent sand filtration, contact filtration, trickling filtration, and activated sludge).

The adaptation of the several methods and the question of ultimate disposition of sewage or sewage effluent are briefly covered.

VINCENT B. LAMOUREUX

Tenth Annual Report of Ohio Conference on Water Purification, Columbus, O., October 14-15, 1930.

The tenth annual report of the Ohio Conference on Water Purification is prepared in its usual style so helpful to the busy reader in that short abstracts of the main papers are included in the front. Round table discussions of plant problems covered many phases of activity, including difficulties encountered due to clogging strainers and intakes, reduction of waste by metering and leakage surveys and descriptions of how to make blueprints of reports and a rain gauge. The longer papers range from talks on water softening, iron removal,

lime as a purification agent, use of ammonia-chlorine process, to suggestions regarding laboratory procedure and media.

ARTHUR P. MILLER

Preventive Management: Mental Hygiene in Industry—*Edited by Henry B. Elkind, M.D. New York: B. C. Forbes Pub. Co., 1931. 234 pp. Price, \$3.00.*

This medium sized volume in large easy reading print is made up of a number of chapters by certain well known writers in the field of industrial psychology and relations, and is an adaptation of a course of eight lectures conducted in the spring of 1930 under the auspices of the Massachusetts State Department of Education in cooperation with the Massachusetts Society for Mental Hygiene. The various authors and their contributions are: Meyer Bloomfield, lawyer, "The Next Step in Industrial Relations"; Ordway Tead, industrial consultant and editor, "Human Nature and Management"; V. V. Anderson, M.D., "Psychiatry in Industry"; Henry B. Elkind, M.D., "Practical Applications of Mental Hygiene in Industry"; Harlow S. Person, author and director of the Taylor Society, "Mental Pitfalls of Leadership"; Karl M. Bowman, M.D., "The Industrial Aspects of Morbid Emotion and Fatigue"; Abraham Myerson, M.D., "Fear and Nervous Energy"; and Elliott Dunlap Smith, lawyer, "The Minor Executive and Mental Hygiene"; with a foreword by Henry P. Kendall, President of the Kendall Company, Boston. While so many writers have stated their respective viewpoints upon a more or less common problem, there is, in fact, very little overlapping.

A unique feature which the reviewer considers quite commendable is the

matter of prefacing each article with a page write-up of its author and his principal achievements, from which the reader can certainly derive a better grasp of the respective viewpoint.

The general theme is that wherever human affairs have been organized to accord completely with the idea that prevention is better than cure, progress has been made. The essence of scientific management may be regarded as an attitude, not simply a performance, and involves both the working man and the management for its success.

The discussion is aimed to be on a non-technical level from which it may appeal not only to the technician and expert in industry, but also to the average executive and foreman. A commensurate bibliography of several pages devoted to articles and books which have appeared in the field within the last 10 years is added as an appendix, while there is also a fitting index.

The symposium makes interesting reading without the verbosity which commonly accompanies many articles in mental hygiene and may be regarded as an exemplary presentation of current thought upon an important subject.

E. R. HAYHURST

Occupation and Health—*An Encyclopaedia of Hygiene, Pathology and Social Welfare*—Published by the International Labour Office, Geneva. Distributed in the United States by the World Peace Foundation, 40 Mt. Vernon St., Boston. (2 vols.) Vol. I, 1000 pp. 181 ill. A-H. Price, \$12.00 per vol.

This encyclopaedia of industrial hygiene has a useful place in the office of every industrial health or medical service, and in the office of every city and state health department which is concerned with problems of industrial hygiene. The first volume is now ready. It is the work of about one hundred of the best known experts in the field of

industrial health. Its statements are concise and expressed in as simple a form as is consistent with scientific accuracy. It deals with three main groups of questions: (1) the work, (2) the worker, (3) the environment.

An illustration of the types of subjects treated may be seen in the following brief section from the table of contents: Acids, Acridine, Acrolein, Actinomycosis, Agricultural labourers, Air. It will be seen that topics include harmful substances, diseases, occupations and harmful conditions of the environment. Each cause of disease is discussed on a uniform plan including the following sub-divisions: Chemistry or biology, Sources of poisoning or infection, Uses of the dangerous product, Mode of action, Statistics, Symptoms, Diagnosis, Method of detection in the environment of the individual, Legislation, Bibliography. The occupational diseases are treated in an equally logical manner, as are also the various environmental conditions.

This document is the most complete and reliable reference work of its type.

C. E. TURNER

Principles and Practices in Health Education—*Report of the Sixth Health Education Conference, American Child Health Association at Sayville, Long Island, June 16-21, 1930.* New York: American Child Health Assn., 1931. 485 pp. Price, \$1.50.

Reporting, almost verbatim, a week's discussion of problems in health education, the American Child Health Association has given educators a most useful volume for reference and teacher preparation. This 1930 Sayville conference, as well as the preceding and similar five, has been generously participated in by specialists. With stenotypist accuracy, the spontaneity of their extemporaneous remarks as well as the firmness of their prepared work is retained and made available. Through

intelligent editing the substance of each contribution is retained intact so that the reader catches the intimacy of the sessions without the mind wanderings so generally observed in stenotypist accounts.

Expressing the theme of the conference as a search for basic principles for health education, Dr. W. H. Kilpatrick presents one of his inimitable philosophical treatises outlining the traditional, the scientific, and the dynamic approaches to teaching. Through his statements that "life is a compound of recurring and unpredictable elements," he gives philosophical foundation for suggestions appearing later in the report relative to dynamic curriculums based upon personal problems. This paper of Kilpatrick's with those of Dr. P. M. Symonds on the Psychology of Learning, Drs. Ned Dearborn and Charles Russell on Teacher Preparation, and Dr. T. D. Wood on the Essentials of a School Health Program, alone, makes the volume important.

The enormous number of contributor-specialists makes it impossible to review each. To suggest outstanding sections is difficult because of the divergence of material and general excellence of the comments. One reads, for example, concrete plans for curriculum construction cited by Principal Manley of Springfield, Mo., County Supervisor Nettie Brogdon of North Carolina, Extension Director Maud Brown of Iowa, and Health Education Director Schmoyer of Lynn, Mass., Dr. C. L. Brownell on Physical Education, H. J. Stack on Objectives in Safety, M. A. Bigelow on health conduct and interdepartmental administration, Haven Emerson on health service, Anne Whitney on integration of instruction, Raymond Franzen on evaluating outcomes, and Joy Morgan on progress in health education.

The book is conveniently divided into chapters according to the conference

sections. At the end a summary chapter on high points, lacking only the concreteness such as will eventually emerge from health education discussions of this kind, presents the principles arrived at during the deliberations.

The volume is encyclopedic and will indispensably supplement modern books on specific phases of health education.

D. OBERTEUFFER

Manual of Tuberculosis for Nurses
—By E. Ashworth Underwood,
D.P.H. New York: Wood, 1931.
272 pp. Price, \$2.50.

In the author's own words, "the aim of this manual is to provide, in convenient form, the information which is likely to be required by nurses who are engaged in the hospital management of tuberculosis cases, and also to meet the needs of those who are preparing for the final examination for such qualifications"—i.e., the qualifications for the Certificate of the Tuberculosis Association. Because of the particular purpose for which the book was written, the procedures therein are restricted to local methods and conditions and would be, no doubt, seriously questioned in other countries. Therefore it cannot be used as a guide for nurses generally.

This is to be regretted, for there are few sources of information about tuberculosis which give as complete and yet as simple, logical and clear explanations of terms, progress of the disease, treatments and procedures. It is perfectly clear to anyone, nurse or lay person, the reason for each statement the author makes, because of the unusually logical development of each topic.

The social phases of tuberculosis are well explained. If the author had spent less time upon elementary nursing procedures, such as how to take a temperature and give a bed bath, and had given more definite instructions regarding concurrent disinfection and home care, the book would be more valuable for nurses

called upon to give care to the tuberculous in their homes.

It is to be hoped that the part pertaining to procedures and treatments may be made to apply more generally, for then the book would be a great aid to both private and public health nurses. The paragraph headings, indexed as they are, make for ready reference. The summaries at the end of the chapters are mines of information. The book is well printed, easy to read and nicely bound.

VIRGINIA A. JONES

Accidental Injuries. The Medico-Legal Aspects of Workmen's Compensation and Public Liability—By Henry H. Kessler, M.D. Philadelphia: Lea and Febiger, 1931. 718 pp. Price, \$10.00.

The intensively busy manufacturing State of New Jersey including its great chemical industries has provided the author a rich field for 11 years' experience as medical director of the state's rehabilitation clinic, the first one in the country, coupled with his former capacity as medical adviser of the compensation bureau.

The present work is based on an experience of more than 63,000 cases personally examined and a close following of foreign experience, especially as described by that of L. Imbert. It stands unique among American texts and may be expected to fill a decided want for physicians, lawyers, employers, insurance companies and industrial accident boards and commissions for guidance as conceived by an orthopedic surgeon and industrial hygienist who is constantly dealing with the medico legal features of accident and disease cases. The Foreword is by the well known surgeon, Dr. Fred H. Albee, Chairman of the New Jersey Commission on Rehabilitation.

The first 7 chapters comprise an historical review, the medical aspects of

workmen's compensation laws, the basis of scheduling injuries, the general pathology and end-results of trauma, and the criterions of temporary and permanent disability. The next 10 chapters are devoted to trauma of various parts of the body with pertinent anatomico-physiological discussions and evaluations, usually in percentage, of damage and disability suffered. Chapter XVII on Injury and Disease deals in a masterly way with this most controversial topic and is followed by a short chapter on Traumatic Neuroses. Disturbance of function is recognized as the key to compensation and attempted rehabilitation.

Hygienists will be particularly interested in Chapter XIX, which devotes 124 pages to occupational diseases, stressing the medico legal aspects of foreign and domestic legislation with tables of schedules, matters of arbitration, the fixing of responsibility and the evaluation of disability. Some 28 pages, devoted to lead poisoning, present summaries of 213 cases in the author's series but also extensive inclusions from others, much of which is in classified and tabular form. There follow commensurate discussions of the other common industrial poisons, anthrax, radium, the dermatoses and silicosis. The final chapter is devoted to rehabilitation of the physically handicapped.

The work is essentially the author's own, who writes as one thoroughly versed in his subject and widely experienced in practice. Extensive bibliographies are appended throughout for those who would seek further. Numerous fine half-tone figures illumine the text. Tables, court decisions and case citations abound.

Health conservationists will be interested in the author's plea for a public negligence law to provide compensation for non-industrial accidents and other disabilities suffered indirectly as the re-

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sult of modern congestion, speed of activity, and a chemico-mechanistic existence.

EMERY R. HAYHURST

Asthma and Hay Fever in Theory and Practice—By Arthur F. Coca, Matthew Walzer, and August A. Thommen. Springfield: Charles C. Thomas, 1931. Price, \$8.50.

The authors have thought it necessary to explain the publication of another book on the general subject of allergic diseases, since several have appeared within the last year. There can be no question that specialists and general practitioners alike are coming to recognize the importance of allergic phenomena, not only as seen in special diseases, but also following the administration of the many biological preparations which are now so widely employed in the practice of medicine. We feel that there is no need for the explanation of the authors, since all authoritative knowledge on the subject will be welcomed.

Recognizing that any one man would find extreme difficulty in covering such a subject thoroughly, the book has been written by three authors, all attached to the same school: Part I: Hypersensitiveness, Anaphylaxis, Allergy, by Arthur F. Coca, M.D.; Part II: Asthma, by Matthew Walzer, M.D.; Part III: Hay Fever, by August A. Thommen, M.D. Chapter XVII is the combined effort of Walzer and Thommen, while Katherine Bowman is the joint author of Chapter XVIII.

A work of this sort does not lend itself readily to a detailed review. Each part is introduced by an historical section and followed by an excellent bibliography. The book is concluded with a good general index and a special index of Atopens and Excitants.

In general it may be said that each author has covered his subject in an authoritative manner, which leaves little or nothing to be desired as far as

our present knowledge goes. The third part is especially well illustrated with photographs of trees, grasses, weeds, and their pollens. Even if one has a reasonable familiarity with the general subject, he will be astonished at the great number of excitants to which certain people are sensitive.

The book is well printed, although there are some typographical errors. Unfortunately, heavy paper has been used. It can be commended as one of the most complete treatises on the subject, and the names of the authors insure the accuracy of its statements.

M. P. RAVENEL

Population Problems—By Warren S. Thompson, Director of Scripps Foundation for Research in Population Problems, Miami University. New York: McGraw-Hill, 1930. Price, \$3.75.

The first book is written largely from the standpoint of economics and sociology. Public health as such is not considered, though one chapter is devoted to Famine and Disease as Factors in Population Growth. A number of other important matters which affect public health are treated from the same aspect, such as the relation of overpopulation to unemployment, the teaching of the churches based on the biblical injunction to "be fruitful and multiply, and replenish the earth," and the action of states which encourage the increase in population on account of military power.

The author correctly holds that those who raise families are penalized economically, and believes it is high time to consider the "compensation of mothers as mothers."

The effect of the feeble-minded on the population is well treated under the chapter devoted to The Problem of Quality. Other subjects of interest are: make-up of population, future growth in the United States, world-wide trends,

the effects of migration, emigration, and immigration.

The book is well balanced, but we wish to commend particularly the chapter on The Negro in the United States, which strikes us as being an unusually sane presentation of a vexed question.

The book is written in a very attractive manner. It contains a great deal of history, and each chapter is full of interest. The printing and binding are excellent. There are a good bibliography and an index. M. P. RAVENEL

International Studies on the Relation between the Private and Official Practice of Medicine with special reference to the Prevention of Disease—By Sir Arthur Newsholme. Vol. II. Baltimore: Williams & Wilkins, 1931. 249 pp. Price, \$4.00.

The second volume of Sir Arthur Newsholme's *International Studies*, conducted for the Milbank Memorial Fund, follows closely upon the first (see September JOURNAL, page 1076). It deals with a group of countries whose programs are less helpful as potential guides for American progress but which are essential to the general picture of European experience.

In Belgium, the bulk of health work of the more progressive types is carried by voluntary organizations for infant welfare, and the control of tuberculosis and venereal disease, which are somewhat unfortunately split up along racial and religious lines. Sir Arthur highly commends the program for the control of alcoholism and the scientific application of medicine in the field of penology. Sickness insurance is at present voluntary but likely to be made compulsory by impending legislation.

In the next two nations represented, France and Italy, we find a high degree of governmental and social centralization and relative backwardness in the development of health and social serv-

ices. France has very recently enacted a law providing for sickness insurance, while Italy has not as yet done so except for tuberculosis. In both countries the highly centralized system of government has proved a serious block to local health progress, and in France the reactionary attitude of the powerful medical trades unions has proved an even more serious obstacle. The insistence of the medical syndicates upon the control of dispensary patients by the family physician and upon professional secrecy in its extremest form has made not only public health progress but even the collection of adequate vital statistics exceedingly difficult. The medical profession has endorsed the new sickness insurance act by a vote of 8 to 1, but insists on payment for services rendered and not on a capitation basis. The brightest spot in the picture is the work of the Office d'Hygiene Sociale in the fields of tuberculosis, venereal disease and child welfare.

In discussing Italy, Sir Arthur points out the difficulties due to extreme centralization, all provincial health officers being appointed from Rome and local health work being very elementary except in the large cities. He rightly elaborates on the splendid work done in Milan, which has one of the finest systems of school medical inspection in the world, and has reduced its general death rate from 32.8 in 1878 to 12.5 in 1927. A fuller consideration might well have been given to the splendid work done in recent years in the control of malaria throughout Italy.

Hungary is a country seriously hampered by economic stringency and a somewhat cumbersome governmental system. The outstanding achievements are the magnificent Hygienic Institute of Bela Johan and the work done for maternal and infant welfare by the Stefania Society (a voluntary organization with considerable government subsidies). The tuberculosis death rate

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was still 260 per 10,000 in 1925. Private medical practice has almost disappeared and doctors are woefully underpaid, as a result rather of the general economic condition than of faults in the National Insurance Act.

Czechoslovakia, Yugoslavia and Poland give us the picture of nations created since the war with comprehensive and modern systems of public health and social insurance but hampered in many ways by economic limitations. Sickness insurance in all is compulsory, and treatment is largely carried on in clinics with little free choice of doctors in Czechoslovakia and Yugoslavia, and too much "wandering" from doctor to doctor in Poland. The Czechoslovakia program is particularly notable for the successful coördination of voluntary health activities under a National Council of Social Hygiene.

In Poland the School of Hygiene and the central Nursing School in Warsaw are outstanding beacons of progress and local health centers are being developed throughout the country with marked success.

In Yugoslavia there is a somewhat similar program, Hygienic Institutes at 9 provincial centers, smaller health institutes (80), and still smaller village stations (500). The latter are of a very primitive character, providing chiefly for bathing facilities and medical care rather than public health work in our sense; but the effort to bring the fundamentals of modern sanitation and medicine to all parts of so primitive a country is one of the boldest and finest ever made in any country. Sir Arthur deals only with the work in Croatia. If he had seen it under the vastly more difficult conditions of the Macedonian mountains, his admiration would have been even greater.

It is a source of legitimate pride to America that in the work of the Office of Social Hygiene in Paris, the anti-malaria work of Italy, the Hygienic Insti-

tutes and health centers of Czechoslovakia, Hungary, Yugoslavia and Poland, the aid of the Rockefeller Foundation has played an important part.
C.-E. A. WINSLOW

Essays on Population—By James A. Field. Edited by Helen Fisher Hohman. Chicago: University of Chicago Press, 1931. Price, \$3.50.

This volume is as it were a memorial to the author, who died in 1927. Like the book, *Population Problems*, by Thompson, it also is written from the economical and sociological standpoints and contains much very interesting history. It is made up of a series of essays, the longest of which is on the Malthusian Controversy in England.

Some of the essays have been compiled by the editor from manuscript notes, and some reprinted. The book is well written and extremely interesting, though some of the essays date back as far as 1906; and others, though of later date, such as those on eugenics and birth control, do not take cognizance of the progress which the world has made since they were written.

There is a Foreword by James Bonar, LL.D., and an Editor's Preface, followed by a biographical sketch of the author. The printing and make-up are excellent.

M. P. RAVENEL

Proceedings Fifth Annual Conference, Maryland-Delaware Water and Sewerage Association, Wilmington, Del., May 5-6, 1931.

The proceedings of the fifth annual Conference of the Maryland-Delaware Water and Sewerage Association dealt with the water supply problems confronting the municipalities of these two states. The water supply of Wilmington, Del., was discussed in three papers, one on the pollution of Brandywine Creek by Willem Rudolfs, and others on the history of the supply and new dam

construction. Other papers included filter plant problems, small town water works, odor and taste control, and regional planning.

Two very important papers discussed the troubles in Maryland created by the

drought of 1930, watershed cover and water conservation. The question box covered a number of problems on water works and sewerage construction and plant operation.

VINCENT B. LAMOUREUX

BOOKS RECEIVED

- YELLOW FEVER. AN EPIDEMIOLOGICAL AND HISTORICAL STUDY OF ITS PLACE OF ORIGIN.** By Henry Rose Carter. Baltimore: Williams & Wilkins, 1931. 308 pp. Price, \$5 00.
- NUTRITION AND PHYSICAL FITNESS.** By L. Jean Bogert. Philadelphia: Saunders, 1931. 554 pp. Price, \$3.00.
- PERSONAL HYGIENE APPLIED.** 4th ed. Jesse Feiring Williams. Philadelphia: Saunders, 1931. 520 pp. Price, \$2.25.
- THE TRAINING OF SOCIAL WORKERS.** By James Edward Hagerty. New York: McGraw-Hill, 1931. 205 pp. Price, \$2.50.
- PRINCIPLES AND PRACTICE OF HYGIENE. A Textbook for College Students.** Philadelphia: Blakiston, 1931. 251 pp. Price, \$1.75.
- THE LUNGS AND THE EARLY STAGES OF TUBERCULOSIS.** By Lawrason Brown and Fred H. Heise. New York: Appleton, 1931. 151 pp. Price, \$1.50.
- TABLES OF FOOD VALUES.** By Alice V. Bradley. Peoria: Manual Arts Press, 1931. 128 pp. Price, \$2.00.
- ANNALS OF THE PICKETT-THOMSON RESEARCH LABORATORY, Vol. VII.** Baltimore: Williams & Wilkins, 1931. 441 pp. Price, \$10 00.
- THE GREAT PHYSICIAN. A LIFE OF SIR WILLIAM OSLER.** By Edith Gittings Reid. New York: Oxford, 1931. 299 pp. Price, \$3.50.
- JUNGLES PREFERRED.** By Janet Miller. New York: Houghton Mifflin, 1931. 321 pp. Price, \$3 50.
- SIMPLE LESSONS IN HUMAN ANATOMY.** By B. C. H. Harvey. Chicago: American Medical Association, 1931. 434 pp. Price, \$2.00.
- THE SCIENCE OF HUMAN LIVING.** By Mae Johnson Corwin. San Francisco: Harr Wagner, 1931. 450 pp. Price, \$1.68.
- MASTODONS, MICROBES AND MAN.** 2d ed. By W. W. Peter. New York: Cleanliness Institute, 1931. 27 pp.
- LACTOBACILLUS ACIDOPHILUS. AN ANNOTATED BIBLIOGRAPHY TO 1931.** By W. D. Frost and Hazel Hankinson. Milton, Wis.: Davis-Greene Corp., 1931. 160 pp. Price, \$1.00.
- LEAGUE OF NATIONS. HEALTH ORGANIZATION. HOUSING AND MALARIA.** By Clayton Lane. Boston: World Peace Foundation, 1931. 43 pp. Price, \$40.
- LEAGUE OF NATIONS. HEALTH ORGANIZATION. EUROPEAN CONFERENCE ON RURAL HYGIENE.** Boston: World Peace Foundation, 1931. 62 pp. Price, \$50.
- MALARIA CONTROL BY ANTI-MOSQUITO MEASURES.** By Gordon Covell. Calcutta: Thacker, Spink & Co., 1931. 143 pp. Price, \$2.00.
- A SHORT HISTORY OF NURSING.** 3d ed. By Lavinia N. Dock and Isabel M. Stewart. New York: Putnam, 1931. 404 pp. Price, \$3.00.
- THE HISTORY OF PAEDIATRICS.** By George Frederic Still. New York: Oxford, 1931. 525 pp. Price, \$8.00.
- PAYING YOUR SICKNESS BILLS.** By Michael M. Davis. Chicago: University of Chicago Press, 1931. 276 pp. Price, \$2.50.
- LEAGUE OF NATIONS. HEALTH ORGANIZATION. REPORT OF THE LABORATORY CONFERENCE ON THE SERODIAGNOSIS OF SYPHILIS.** Boston: World Peace Foundation, 1931. 131 pp. Price, \$80.
- NUCLEIC ACIDS.** By P. A. Levene and Lawrence W. Bass. New York: Chemical Catalog Co., 1931. 337 pp. Price, \$4.50.
- GOVERNMENTAL REPORTING IN CHICAGO.** By Herman C. Beyle. Chicago: University of Chicago Press, 1931. 303 pp. Price, \$4.00.
- BOOKLET ON GROWTH, BOOKLET ON HABITS, BOOKLET ON PERSONALITY, BASED ON REPORTS OF THE WHITE HOUSE CONFERENCE ON CHILD HEALTH AND PROTECTION.** Prepared by Marion Lyon Faëgre. St. Paul: Farmer's Wife, 1931. Price for the set, \$4.5.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Preventive Medicine—A stimulating discussion of the interrelationships between public health and preventive medicine in private practice, and the opportunity of the county unit to foster sound health administration.

ARMSTRONG, D. B. Adequate County Health Organization, Tuberculosis Control and the Medical Profession. *New England J. Med.*, 205, 12: 569 (Sept. 17), 1931.

Tuberculosis in the Rural South—Although tuberculosis is definitely lower in children of southern rural districts than in a typical northern city, the increase of infection with age is similar in trend. Of colored children 60 per cent reacted, whereas only 51 per cent of the white children from 5 to 9 gave evidence of infection.

ARONSON, J. D. Incidence of Tuberculous Infection in Some Communities of the South. *Am. J. Hyg.*, 14, 2: 374 (Sept.), 1931.

Public Health Pioneering—British opinion commending the trial of new hygienic projects by local authorities in a country where health administration is much more standardized than in our own.

BUCHANAN, G. Some Recent Policies Regarding Particular Diseases. *Brit. M. J.*, 3684: 283 (Aug. 15), 1931.

Coal Mining and Tuberculosis—Though the coal miner has a relatively low death rate from tuberculosis, the death rates (in Great Britain) from bronchitis are high. The discussion of the phenomenon has much of value to American sanitarians.

CUMMINS, S. L. Coal Miners and Tuberculosis. *J. State Med.*, 39, 9: 526 (Sept.), 1931.

Finding Childhood Tuberculosis—Opportunities open to the public health

nurse are suggested in this clear account of diagnostic measures.

EDWARDS, H. R. Tuberculosis in Children. *Pub. Health Nurse*, 23, 9: 402 (Sept.), 1931.

When Death Rates Go Up—This absorbing dissertation on the real meaning of death and birth rates and population figures, intended for the intelligent layman, has plenty of meat for the viewers-with-pride among our ebullient statisticians.

FAIRCHILD, H. P. When Our Death Rates Go Up. *Survey Graphic*, 66, 11: 510 (Sept.), 1931.

Tuberculosis in Tennessee—Chief among the features of this program are case-finding clinics, consultant service, nursing follow-up, and study of hospital needs. The first is discussed in detail. A program that would be applicable to most states it would seem.

GASS, R. S., and BISHOP, E. L. Tuberculosis Control in Tennessee. *J. A. M. A.*, 97, 12: 843 (Sept. 14), 1931.

Experimental Epidemiology—Another demonstration of herd reaction to infection by Greenwood's mice.

GREENWOOD, M. Factors Determining the Difference Between an Epidemic of One Disease and that of Another. *Brit. M. J.*, 3683: 231 (Aug. 8), 1931.

In the Cause of Health Education—Reasons why physicians ought to use their influence toward improving the health courses in public schools.

Ivy, A. C. A Deficiency in Present Day Education. *J. A. M. A.*, 97, 9: 588 (Aug. 29), 1931.

Medical Societies and Public Health—Pleading for more efficient participation in public health administration by county medical societies, the author makes some bald statements that

might be challenged, but the value of the proposal is not to be doubted.

McLAUGHLIN, A. J. The Medical Profession and the Public Health. *Pub. Health Rep.*, 46, 35: 2041 (Aug. 28), 1931.

A County Health Survey—Recommendations for improved service based upon this survey of a southern county health department would apply to most administrative units, large or small.

MOUNTAIN, J. W. Public Health Service in Knox County, Tenn. *Pub. Health Rep.*, 46, 34: 1981 (Aug. 21), 1931.

Community Public Health Nursing—A complete answer to the question: what is public health nursing? The problems of community organization are given a thorough airing.

NELSON, S. C. How Public Health Nursing Can Best Serve the Community. *Mod. Hosp.*, 37, 3: 128 (Sept.), 1931.

About Tuberculosis Prevention—In this progress report of the Massachusetts 10-year plan are many practical conclusions. A definite relation exists between the adult tuberculosis death rate, per cent of child reactors and cases of tuberculosis in school children. Exposure in the home is the most potent factor in producing childhood infection. There is much more.

POPE, A. S. The Discovery and Prevention of Tuberculosis in the Community. *J. A. M. A.*, 97, 12: 846 (Sept. 19), 1931.

Further Experience with BCG Vaccine—From Canada comes more evidence in support of the immunizing value of BCG vaccine.

RANKIN, A. C. BCG Vaccine. *Canad. Pub. Health J.*, 22, 9: 459 (Sept.), 1931.

British Views on Sex Education—Excellent indeed is this presentation of the need for better sex education by a British churchman addressing an annual meeting of the British Medical Association. Imagine the A. M. A. including

this subject from such an ecclesiastic source.

PYM, T. W. The Need of Education in Questions of Sex. *Brit. M. J.*, 3682: 186 (Aug. 1), 1931.

Anti-Vivisection Answers—Another well-thought out, logical, and eminently sound statement refuting the mouthings of the anti-vivisectionists. Useful reference material.

REED, C. I. Animal Experimentation. *Ill. Health Quarterly*, 3, 3: 204 (July-Sept.), 1931.

Vision Conservation—What nurses should know about eyesight conservation is told in this symposium, and this information should be a part of the equipment of other health workers.

ROYER, B. F., *et al.* High Lights on the Conservation of Vision. *Am. J. Nurs.*, 31, 9: 1077 (Sept.), 1931.

Research in Public Health—Recounting the progress and methods of research carried on by the Chicago Department of Health through its laboratories.

TONNEY, F. O. Success in Public Health Research. *J. A. M. A.*, 97, 10: 700 (Sept. 5), 1931.

Health Education in Rural Schools—A straightforward account of a job well done under primitive conditions and with only the tools at hand.

WOODBURY, M. C. Health Education in the One-Room School. *Pub. Health Nurse*, 23, 9: 415 (Sept.), 1931.

More Tuberculosis Case-Finding Research—Further findings of the important 10-year program in Massachusetts. One school child in a thousand is found with adult type tuberculosis; a quarter of these are dead after five years. The implications of the whole findings are discussed.

ZACKS, D. What We Have Learned in Massachusetts from the Ten-Year Program. *New England J. Med.*, 205, 11: 525 (Sept. 10), 1931.

NEWS FROM THE FIELD

THE 300,000TH LEITZ MICROSCOPE
THE Optical Works of E. Leitz, in Wetzlar, Germany, have completed their 300,000th microscope. This instrument was presented at an appropriate gathering to Geheimrat Professor Dr. Ludwig Aschoff, of Freiburg, in Breisgau, Germany, a scientist and physician of world renown in the pathological and anatomical field of scientific endeavor.

The dedication of this microscope follows a custom of the firm of E. Leitz to present every 50,000th microscope to an outstanding scientist or institute, thus expressing their appreciation of the co-operation extended by leading authorities to the Leitz Works.

The 100,000th microscope was presented to Dr. Robert Koch, of Berlin, and the 150,000th to Dr. Paul Ehrlich, of Frankfurt.

DRUG CONTROL POLICY UNCHANGED
THERE will be no changes in the policy of the Food and Drug Administration of the U. S. Department of Agriculture pertaining to enforcing the present drug control law, says Dr. F. J. Cullen, the newly appointed chief of drug control.

"Inquiries as to possible changes in drug control policy in enforcing the law have been received, and I take this occasion to state that it is the purpose of the administration, in its regulatory work with drugs and medicinal preparations, to continue vigorously its program of action under the food and drugs act against medicinal preparations falsely and fraudulently represented by label or circular accompanying the package as preventives or treatments for disease conditions."

CHILD HEALTH CONFERENCE ORGANIZED
A COMMISSION of 16 members to study the problems of child health and protection in Iowa was appointed June 9 by Governor Turner. Two conferences have already been held, section and subcommittee chairmen appointed, and plans made to study the entire field of child welfare work in the state and to work out plans for coördination and more efficient operation of the various projects and activities.

MISSOURI DROUGHT AREA RELIEF
THE drought area of Missouri has been divided into 5 districts of 9 counties each, for the administration of the state's share of the \$2,000,000 appropriated by Congress for the U. S. Public Health Service in drought areas. Each district will have a physician, a sanitary engineer, a laboratory technician and 5 nurses.

NEW LEGISLATION IN SWEDEN ON MATERNITY BENEFITS

A ROYAL decree of June 26, 1931, makes provision for the first time in Sweden for the payment of maternity benefits from the national treasury to women, whether married or single, who do not belong to sickness insurance funds and whose income, whether singly or together with that of their husband, is below a certain amount.

The benefit of one krona (26.80 cents) a day is paid for 30 days on the condition that the woman abstain from employment; women who are protected by the labor law and who are by that law required to stay away from work for at least 6 weeks may receive the benefit for 56 days.

The benefits are paid on application to the sickness insurance funds. Each applicant is sent information on the proper care of herself and the child. Midwives' services or hospital care may be provided on request, but a deduction is made from the maternity benefits for such services.

This decree is to become effective by a special proclamation of the King.—*Svenska Författningssamling*, Stockholm, No. 279 (July 4), 1931.

MUTUAL AID FUNDS FOR SCHOOL CHILDREN IN ITALY

A SYSTEM of mutual aid societies was instituted in the Italian schools a few years ago. The societies are under the supervision of a national organization. Their object is to provide medical aid and country vacations for school children and to take measures for preventing sickness and for promoting knowledge of legislation relating to health and social welfare. The money for their support is contributed by the National Social Insurance Fund. Membership is optional for children in the schools, and each child who joins pays an annual fee of about 5 lire (26 cents). This money is saved and when the child reaches the age of 20, it is transferred to his credit in the fund for invalidity and old-age insurance, which is compulsory in Italy for a large majority of the workers; if he is not subject to insurance, it is credited to his account in a savings bank.—*La Stirpe*, Rome, Apr., 1931.

FRENCH DENTAL CLINIC FOR SCHOOL CHILDREN

A DENTAL clinic for school children will be established in the city of Paris. The cost of construction will be covered by a gift from an American philanthropist; the expense of maintaining the clinic will be supplied by the city. This will be the first institution of its kind in Paris; heretofore only

10,000 out of the 250,000 school children were given free treatment in the hospitals and schools of dentistry. Under the new system children will have their teeth examined 3 or 4 times a year and will be sent for treatment to the new clinic.—*Revue Internationale de l'Enfant*, Geneva, Apr., 1931, p. 409.

NATIONAL CHILD WELFARE BUREAU, COSTA RICA

A COSTA RICA law of August 15, 1930, provides for the establishment of a governmental bureau for child welfare work (Patronato Nacional de la Infancia). Emphasis is placed on the protection of the child's health and on watching the conditions of his mental, moral, and social life. Work for the prevention of maternal and child mortality and for the prevention of disease is also among the functions of the bureau. The bureau will prepare plans for the establishment of health resorts, playgrounds, hospitals, and other institutions for children; it will also supply information and advice on child welfare matters and watch over the enforcement of the child welfare laws. A special section enumerates in detail the various subjects which the bureau is expected to study.—*Boletín del Patronato Nacional de la Infancia*, San José, Costa Rica, 1, 1, 1930.

CHILD WELFARE CONGRESS

THE first National Child Welfare Congress of Costa Rica was held in the capital, San José, April 26–May 3, 1931, under the auspices of the recently established National Children's Bureau, which is a branch of the National Government.

A number of papers were presented dealing with various phases of child welfare, for instance, infant mortality, health of mothers and children, school attendance, physical education of school children, and juvenile delinquency.

Many resolutions were passed on the

above subjects. The Congress has asked the government to appoint a committee for drafting bills on juvenile courts, child labor, adoption, children of illegitimate birth, marriage and divorce, and to introduce these bills into the National Legislature in 1932.—*La Gaceta*—*Diario Oficial*, San José, Costa Rica, May 24 and June 19, 1931.

LEAGUE CALENDARS FOR 1932

AN unusually artistic wall calendar is being offered by the Publications Committee of the National League of Nursing Education, 450 Seventh Avenue, New York, N. Y. Also for the first time the committee is presenting a practical desk pad and calendar.

The wall calendar has some charming pictures of many of the Saints from the history of nursing. The frontispiece is Giotto's famous old fresco of "St. Francis and the Birds" done in colors. Among the twelve attractive plates which appear in the wall calendar are St. Vincent de Paul, St. Elizabeth of Hungary, St. Catherine of Siena, Sts. Cosimo and Damian, and Fabiola. The price of the "Nursing Saints Calendar" is \$1.00 per single copy, and \$.75 per copy on orders of 50 or more delivered in one shipment.

The desk pad and calendar has a page for each week of the year, with a space for morning and afternoon appointments for each day. That the calendar pad comes from the League is shown by weekly quotations taken from League publications which are as applicable today as when they were written. The engagement pads will be \$.50 each, or \$.40 if ordered in quantities of 25 or more delivered in one shipment.

CANCER BOOKLETS

THE American Society for the Control of Cancer has put out an excellent series of popular booklets for the laity, giving the main facts concerning cancer and the proper method of pro-

cedure. These booklets will be sent to physicians, health officers, as well as to the laity, free of charge, in single copies or in quantities.

The work of this society is too well known to professional men to need comment. We trust that this information will be spread further through the instrumentality of health officers and readers of this JOURNAL.—Address, American Society for the Control of Cancer, 25 West 43d Street, New York, N. Y.

DELTA OMEGA

AT the annual meeting of Delta Omega, the honorary public health society, which was held in the Windsor Hotel, Montreal, Canada, on Monday, Sept. 14, Dr. James A. Tobey of New York was elected national president, succeeding Dr. John A. Ferrell. Professor Charles G. Hyde of the University of California was elected Vice-President, and Professor Ira V. Hiscock of the Yale School of Medicine was re-elected Secretary-Treasurer.

Dr. Mazÿck P. Ravenel of the University of Missouri was elected the ninth national Honorary Member of the society.

The meeting was attended by about 50 members representing the 6 chapters of Delta Omega, located at Johns Hopkins University School of Hygiene, Harvard School of Public Health, Massachusetts Institute of Technology, University of Michigan, Yale School of Medicine, and University of California.

YEAST RESEARCH

MELLON Institute of Industrial Research, Pittsburgh, Pa., has announced that the institution has accepted from the National Grain Yeast Corp., Belleville, N. J., a grant for a comprehensive investigation of the chemistry and technology of yeast. This research, which will be operated as an Industrial Fellowship of the Insti-

tute, will be conducted with the close collaboration of specialists in the donor's organization; and the results will be made available as the various stages of the studies are completed.

PERSONALS

DR. LEWIS H. HOWARD, who has been city Health Officer of Tucson, Ariz., since April 1, has been appointed Health Officer of Pima County, the city and county units being combined. Dr. Howard succeeds Dr. Alvy Nelson Crain, Member A. P. H. A., who resigned to become Health Officer of Maricopa County, with headquarters in Phoenix, Ariz.

DR. ARTHUR HIERONYMUS, Member A. P. H. A., formerly Health Officer for the City of Alameda, Calif., for 20 years, has been appointed Health Officer of the city of Oakland, Calif.

DR. JAMES F. ELDER, Member A. P. H. A., has resigned as health director of Mahoning County, with headquarters at Youngstown, Ohio. He is succeeded by Dr. George Y. Davis. Dr. Elder has been appointed health director of the third district health unit recently organized in the drought area, comprising nine counties, with headquarters at Van Buren, Mo.

DR. JAMES P. MOON, of Tiptonville, Tenn., Health Officer of Lake County, Tenn., has been elected president of the Mississippi Valley Public Health Workers Association, a permanent organization recently formed.

DR. JESSE LYNN MAHAFFEY, of Haddonfield, N. J., has been appointed director of health of New Jersey, to succeed David C. Bowen, whose term expired.

DR. WILLIAM W. BAUER, Member A. P. H. A., Health Officer of Racine, Wis., for the past 8 years, has been reap-

pointed for a term of 4 years. New quarters for the health department will be opened in the city hall in October.

CONFERENCES

November 6, New York State Association of Public Health Laboratories, Albany, N. Y.

November 9-14, the Ninth Texas Sanitarians' Short School, Houston, Tex.

November 10-13, New York State Conference on Social Work, Niagara Falls, N. Y.

July, 1932, The Second International Conference of Social Work, Frankfurt, Germany.

September 6-9, 1932, Annual Meeting of the International Union Against Tuberculosis, The Hague, Holland.

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American Journal of Public Health and THE NATION'S HEALTH Vol. XIII No. 12

Volume XXI

December, 1931

Number 12

A Suggested Community Mental Hygiene Program*

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IT might be appropriate to change the title of this presentation so that it would read "Suggestions for a Community Program." I hope that I may be successful in stressing the point that a cut and dried pattern is quite out of order, and obstructive to a community program in health and other social fields. There is altogether too much parroting of that sort. A program that fits beautifully into one community is sometimes copied blindly by another and found seriously wanting; or, what is even worse, a program that works only moderately well is copied with its bad as well as its good features. Similarly, too often the sponsors of a program that works out well in one community conclude that a program which differs is to be condemned, even though the differing program may be in a quite different community.

Perhaps it is to be expected that the psychiatrist who can rely so little on formula and prescription in his work, who finds no two cases alike, and has little patience with bionomial diagnosis, would extend his demand for individual treatment to the community. Individualization is the keynote of this presentation, still it must be common sense individualization, and not the sort practised by the man who rejects the experiences of a community of 40,000 population because his problem has to do with the community of 35,000.

The approach to a bit of community organization has certain features in common with medical practice. The community is a patient;

* Presented at a Joint Session of the Child Hygiene and Public Health Nursing Sections of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 14, 1931.

it has defects; perhaps it is suffering because it has not sufficient of a health or social program to allow it satisfactorily to digest its school program. The community is a more or less integrated individual, and no one phase of community endeavor is self-sufficient. Each affects the other and all must be considered in the planning of any one. The community may have disorders as well as defects. It may have attempted to assimilate a health program which is so at odds with its individual characteristics that it suffers permanent distress and seeks help perhaps from this or that national organization. The community is also similar to the patient in that we find the technical approach to a problem to be the same. First there is a complaint, then examination, then diagnosis and prognosis, and finally treatment.

With all of these possibilities for the entrance of variables into the situation, is it not clear that a community program cannot be a finished plan? About the only thing that is finished in the community program is the part that has been so tried that its success is evident. Even that is constantly being supplemented. Instead of conceiving of a community program as a set picture, it is probably more productive to think of it as a chain of probable steps looking into the future. Each step has to be scanned thoroughly and reconditioned before it is put into operation. There must be alternate steps and flexibility which will allow of every opportunity for constructive growth. Such a view of a community program predetermines a policy of slow building and continuous integration, and precludes anything in the nature of mimeographed directions.

There is no such thing as an adequate, universal, community program. Only the individual utilization of experience leads to satisfactory provision to meet a community need. In fact, the satisfactory program is a result of three sets of influences: the community need, the community peculiarities, and the accumulated experience of other communities.

COMMUNITY NEEDS

Community needs are the most constant of this triad because they are the outgrowth of the needs of the people composing the community. People do not differ so much from place to place. We find, in general, that 4 phases of mental hygiene service are demanded: The extreme, or custodial phase, is represented by the feeble-minded and psychotic, who cannot be rehabilitated. The remedial is represented by the ambulant, or institutionalized patient, where the major motive is the elimination of a developed condition, which is in itself intolerable. The preventive mental hygiene effort may often appear in many re-

spects remedial, because a problem already exists, yet if the attack on the problem presented is conditioned more by the future threat than the present, intolerability of the disturbance, the motive of prevention, dominates. The fourth phase is that of enrichment, or positive health, wherein the effort is toward the increasing of the efficiency and margin of safety of the individual as to his mental life, and the releasing of his potentialities thereby, for greater constructive effort and greater enjoyment of life. It is obvious that there is no sharp dividing line between these 4 phases. They represent a gradation, all points of which must enter into the conception of a community program.

Community needs may be conveniently looked at from the standpoint of specific services. A mental hygiene program must consider provision for the major and minor psychoses, borderline deviations, and those arising obscurely in association with other medical and social problems. The program that does not at least consider the mental hygiene needs of the person who has "heartburn" and "gas," or who has an undue fondness for other people's property, is apt later to find its community in the category of those complaining of a defect. Provision for the mentally retarded is an essential part of any program, and the need of the problem child has become so far recognized as a community need that today we find the equivalent of 3,000 hours per week of high grade clinic service for children in the United States. Beyond this point the community mental hygiene needs fall to a large extent outside the medical field and require that the erection of a community program consider, and at least leave place for, mental hygiene functions of the school, the court, the social agency, the recreational agency, the church, the home and the workshop.

The essential developments in these fields should if possible antedate the more complicated psychiatric services for children; in fact the National Committee for Mental Hygiene consistently urges that, even where assured, the establishment of a child guidance clinic await such development if there is any reasonable hope of success.

The extent of decentralization that is necessary to insure geographical and functional economy in these various fields must be considered. Is time saved and is coöperation effected from close proximity to the case, with the effort and expense of putting it through, instead of at a central point? How far must strong centralization be insisted on? A community needs both the benefits of centralization and decentralization, and the optional compromise based on individual circumstances is the answer. Such services as night clinics for the employed, and observation facilities, are features which represent a response to a need for all-around economy of service. Many other tricks

of program organization, representing community needs, are revealed in a study of accumulated experience.

COMMUNITY PECULIARITIES

Community peculiarities represent the chief variable in the construction of a program and exact of us this much stressed individual consideration. Unless we know community peculiarities, we have no basis for integrating our accumulated experiences so that they will meet community needs. The survey approach is the chief instrument for bringing community peculiarities into the form of workable data. Such a survey may be made specifically from the mental hygiene viewpoint, or may be part of a broader health or welfare study.

This community examination is, of course, best done by one who is accustomed to making such studies, and for the most part, such persons are associated with, or known to, national agencies. But at times it is necessary to rely on a local or imported person whose authority lies in the technical mental hygiene field, although not experienced in the variables of community organization. Less satisfactory, but still far better than ignorance, is the self-survey, whereby the examination is conducted by inexperienced local talent, if possible, with authoritative direction, maybe from the outside. Such a community examination should reveal peculiarities of size, population, geographical and climatic influences, culture, wealth, social structure, efforts in progress which bear on mental health, and proximity to centers of population, universities, hospitals and other resources. The study should reveal community habits of stability and political attitudes and interferences. Ignorance of these things has been a cause of grief to many a project otherwise well conceived.

ACCUMULATED EXPERIENCE

Given an appreciation of community needs and peculiarities, we look to accumulated experience to guide us to a course of action. Accumulated experience is quite different from isolated experience, the guide which is used when one community copies the plan used by another. Accumulation of experience requires the study of a large number, as many as possible, of programs in action under different conditions and with various degrees of success. It is preferably analytical so that the causes of success and failure are not ignored, and so that a good trick in a poor total job, or a poor element in a total good program, will not pass unnoticed. The accumulation of experience is primarily the job of the national agency, which is most apt to see in one city the very experience that another is looking for. The national

agency is in a position to watch a trend developing, to keep in touch with it, to evaluate it by comparison with other experiences, and to call it to the attention of the community which needs it. If for nothing else than to lay out an itinerary for the accumulation of experience by those locally involved in construction of a mental hygiene program, I feel that the national agency has a contribution to make to every project of this sort. I say this not with the spirit of vaunting, but with the seriousness that comes from seeing the valuable discoveries and precious experience of a program in one place ignored by another.

Reduced to its essentials, the foregoing discussion of the philosophy surrounding the creation of a community program could be stated as follows:

A community program is not a completed picture, but a line of procedure with alternate steps. It must consider all phases of mental health work—custodial, remedial, preventive, and enriching. It must cover the major and minor psychoses, borderline deviations, account for the feeble-minded, and serve the problem child. It must be adapted to the individual community through the reconciliation of community needs, community peculiarities, and accumulated experience. The creation of a community program is a job of individual case procedure.

However, generalized statements about individualizing are not much of a guide or help when it comes to a real situation, unless they can be attached to something. I shall therefore temper this plea for individualization by presenting something concrete, a sort of platform from which to take orderly steps. I have chosen, as my paradigm, the city of 75,000 to 200,000 population. In such a city there is little opportunity for the degree of specialization which exists in larger cities, where there are clinics for adults, court cases, school cases, social agency cases, college students, children, preschool children, retarded children, superior children, and so on. A city of 100,000, in order to get the benefits of clinical and educational work, and the community leadership that comes from an adequately staffed full-time program, must work out a plan including all phases of the job.

Such a community might plan on a budget of \$15,000 to \$20,000 to develop a working unit consisting of a psychiatrist, psychologist and 2 psychiatric social workers, with a schedule laid out to cover the community needs as outlined above. The essentials of this would be: service to adults, which might consume 2 days a week of this unit's time; service to problem children, which might consume another 2 days, and work with the mental defective the fifth day. These sessions might be held at the same place, possibly under different names,

or they might scatter. It might be that the 2 days for children would be divided; that 1 of the days for adults would be devoted to the neuroses and consultations on cases from other medical services. The remaining half day of the week might be devoted to consultation service with a nursing agency, social service agency or juvenile court, or such consultation services might be given in place of part of the time devoted to adults, children, or mentally defective.

A definite part of such a program should be its educational effort, and this should be a consciously planned thing, not merely the result of chance. It should grow out of the needs for such activity as they are revealed by the cases, and should accordingly be directed toward professional and lay groups. Similarly, growing out of the case work should be a responsibility for community improvement so that those stresses which are contributing to the mental hygiene problems may be attacked as a designated part of the job.

Such a program should have a committee or board sufficiently free of other obligations and of sufficient local standing to govern it, insure its interpretation to and integration with the community, and be able to reveal the community to the clinic staff. It should assume full responsibility for financial stability. Such a board might well be an outgrowth of the group which originally studied the community's peculiarities through a survey.

This skeleton of a program for a city of 75,000 to 200,000 should provide a useful point of departure for the city that is either larger or smaller. The city of 200,000 could well afford to specialize to the point of providing a full-time unit for children, and a city twice that size would probably find that besides a community unit, a public school or juvenile court unit would be a logical direction of growth.

The city under 75,000 would have more difficulty because of the necessity for getting part-time personnel. However, there is already justification for considering partnership between smaller cities whereby the benefits of the larger support can be secured. Such partnership may be worked out between a small city and an institution or university. Much of the promise of the future, however, lies in the participation of the state in the program of the small city and rural district. The state hospital is particularly strategic in serving this part of the population which, it must not be forgotten, includes 75 per cent of the whole.

A psychopathic hospital or a university is similarly able to aid a mental hygiene program in the smaller community, and in some instances state departments of health, education and welfare have demonstrated their possible contribution. The construction of a program

for the smaller community requires the reduction to a minimum of makeshift and irregularity, careful attention to follow-up, and the evaluation and utilization to the utmost of local capacity for participation. I hesitate to say much about program planning for the small community for we are just now bringing together the experiences of the states which have experimented along these lines. Two field workers are spending a year and a half studying existing programs to draw therefrom elements that may be of value as accumulated experience.

One of the most valuable beginnings for a community wishing to make a start in a mental health program is the securing of a visiting teacher for the public schools, and I recommend serious consideration of this.

In conclusion, may I again express the hope that any who may have been looking for a formula may, in place of it, achieve a viewpoint that will result in an individually conceived, and therefore more appropriate, plan for mental hygiene service to a community.

Dental Caries

IN an Interim Report, the Medical Research Council has given an answer to the second of two questions which it is considering:

"(b) Can the incidence and rate of progress of caries in teeth already erupted be lessened by the adoption of similar dietetic measures?"

1. In groups of children, numbering from 65 to 86, living under similar institutional conditions, each group receiving a certain specific addition to the standard dietary, over a period of 2 years, the progress of caries in the permanent teeth has been significantly retarded in those children receiving an added ration of fat-soluble vitamins as compared with those whose additions consisted of treacle and olive oil respectively; the increase of caries in the vitamin group, whether measured by its incidence or its extent, being approximately one-third of that in the other groups.

2. In two groups of children, numbering 82 to 79 respectively, living in the same institution under identical conditions, each receiving as an addition to the standard dietary a measured ration of olive oil, to which in the case of one group a solution of vitamin D was added, over a period of 1½ years, the progress of caries in the permanent teeth was also significantly retarded in the vitamin group as compared with the group which received olive oil as the only addition.

3. When allowance is made for the shorter period of the second as compared with the first investigation, a general similarity is observable, in the rate of increase of caries, between the group receiving cod liver oil (vitamins A and D) and that receiving radiostol (vitamin D).

4. There was no significant difference in the rate of increase of caries between the children receiving olive oil and those receiving treacle, in the first investigation.

—*Special Report Series, No. 159*, by the Committee upon Dental Disease, Medical Research Council, 1931.

British Public Health and Its Present Trend*

GEORGE. F. BUCHAN, M. D., M. R. C. P., D. P. H., HON. F. A. P. H. A.

Medical Officer of Health, Willesden, England

IT is difficult to say when public health began, but it is probably as old as communities. The need for communal action for the protection of the public health has no doubt been realized because of the ravages of epidemic disease. It is probably beyond dispute that the Black Death in Britain in the 14th century and the Plague in London in the 17th century have been important influences in the development of British public health.

Public health assumed a definite form in Britain during the 19th century, and it is interesting to note that it has extended with every extension of the franchise. In Britain there have been four great extensions of the franchise, in 1832, 1867, 1884 and 1918. Following the extension of the franchise in 1832 the reform of the Poor Law began in 1834 and reform of Local Government in 1835. These changes were followed by the passing of the first Public Health Act in 1848. The next extension of the franchise in 1867 was followed by the Public Health Act of 1875 which still remains in England as the health charter of the people. The extension of the franchise in 1884 was followed by further reforms of Local Government in 1888 and 1894. These local government reforms created county councils and placed certain definite public health responsibilities on other local authorities, particularly the urban and rural district councils. The last great extension of the franchise was in 1918, when the number of parliamentary voters was practically trebled and for the first time included women. This last act of enfranchisement was followed by the Local Government Act of 1929 which indicates the present trend of public health administration in Britain.

In spite of much legislation during the present century it is nevertheless true that the Public Health Act passed in 1875 is still the most important public health measure on the Statute Book in Britain. This Act deals with environmental hygiene, with the protection of the pub-

* Read before a Special Session of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 15, 1931.

lic against unsound food, with infectious diseases and the establishment of infectious diseases hospitals, while it gives to the Minister of Health power to make regulations for the control of infectious diseases. It is under this Act that in recent years health authorities in England have been required to deal with tuberculosis, venereal diseases, ophthalmia neonatorum and puerperal pyrexia. It is also under this Act that local authorities may maintain general or special hospitals. But when all is said and done the Act of 1875 has been mainly used to deal with environmental conditions as they affect health, and with measures for the protection of the public against the spread of infectious diseases.

It was not until the beginning of the present century that a more personal view of public health began to be taken. In 1902 the first Midwives Act was passed. This Act seeks to protect the woman against unskilled attention at confinement. It requires that every woman practising midwifery should be trained and certificated according to a standard laid down.

In 1907 the first Notification of Births Act was passed. This Act has for its object the early notification of births so that advice and help may be given early to mothers on the healthy upbringing of their children. It was at first subject to voluntary adoption by local authorities, which is a common procedure in Britain when a measure is to be tried out. Later in 1915 Parliament made this Act compulsory on all authorities. The next development of personal hygiene was also in 1907, when the Act requiring provision to be made for the medical inspection of school children was passed. This Act while embodying a compulsory provision regarding medical inspection embodied a voluntary provision with regard to treatment. This voluntary provision was subsequently made compulsory in the Education Act of 1918.

In 1911 another important Act dealing with the care of the individual was passed, namely, the National Health Insurance Act. This Act compelled those persons mentioned in the Act—generally speaking, persons with an income of less than £250 per annum—to insure under a State Scheme. Among the benefits conferred under this system of State Insurance was medical benefit, i.e., general practitioner treatment. The National Health Insurance Act can hardly be said to be preventive in character although there are some rarely used provisions in it which have been conceived on a preventive basis. The Act however is of great importance in that an insured person is able to secure treatment immediately he becomes ill without additional expense to himself. This Act was also instrumental in initiating schemes

for dealing with tuberculosis which have since become applicable to the whole community.

In 1918 a further step forward was taken by the State in respect to the care of personal health. In this year the Maternity and Child Welfare Act was passed, enabling local authorities to establish, subject to the approval of the Minister of Health, schemes for the care of expectant and nursing mothers, infants, and young children, and it is under this Act that practically all the maternity and child welfare work in Britain is being carried out.

UNIFICATION OF CENTRAL AND LOCAL AUTHORITIES

It will be readily understood that as these various measures for the protection of the health of the public were being rapidly passed by Parliament, the necessity for some State supervision of their working became more and more apparent. The result was that in 1919 the Ministry of Health was established by Act of Parliament for the purpose of controlling all functions of the State relative to public health and the State practice of medicine, whether preventive or curative. With this concentration of the medical and public health functions of the State in a single Central Health Department, the need for concentrating the public health functions of local authorities in a single local authority for each area became equally apparent. Toward this end the Local Government Act of 1929 has taken a step. This Act abolishes boards of guardians under which the Poor Law system of medicine has developed in Britain, and transfers all the functions of boards of guardians to county boroughs and county councils. This transference has been made in order that county boroughs and county councils at a later date may incorporate the old Poor Law system of medicine with the public health system of medicine in operation in their areas. This Act came into operation in 1930, and it doubtless will have a very important bearing on public health progress in Britain.

THE LOCAL GOVERNMENT ACT, 1929

The main provisions of the Act may be conveniently discussed under four headings:

1. *To Improve Local Government*—The Act seeks to establish that local governing authorities shall be large enough to look after themselves. The Act also enables steps to be taken by which in the long run there may be only one local health authority in any area and not two or three as at present. This ultimate issue will depend largely on the wisdom and vision of the county councils entrusted with very large powers under the Act. The Act if well administered should pave the way for the general establishment of county borough health administration throughout Britain. The county boroughs vary in population from about 25,000 to over

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1,000,000, and the county borough council in each of these areas is required to administer all local public health services. In Scotland but not in England this includes mental health. This reduction in the number of local health authorities and unification of their powers should make for a rapid extension of public health work.

2. *To Extend and Improve Hospital Accommodation*—In connection with any extension of public health work the importance of the hospital is becoming more and more apparent. If a local authority decides to establish a clinic for the early diagnosis and treatment of cancer, hospital beds are necessary. Similarly, if it decides that the rheumatic child should have attention, beds are again necessary. Like statements may be made about all the most recent advances in public health administration. It would therefore appear that for the proper development of public health work easy access to hospital beds is essential.

Prior to the operation of this Act there were in England and Wales the voluntary general and special hospitals with 50,000 beds, which still remain as such; the Poor Law general hospitals with 120,000 beds, which have now been transferred to county boroughs and county councils and have become the municipal general and county council general hospitals; and the special hospitals of local authorities for tuberculosis, infectious diseases, maternity, and so forth, with 60,000 beds. It will therefore be observed that there now exist in England and Wales 50,000 voluntary hospital beds under voluntary management and 180,000 municipal or county council hospital beds under public management.

It is provided in the Local Government Act, 1929, that extension of any of these hospitals in any area should take place only after consultation between the voluntary and public managers of hospitals in the area. Hitherto the voluntary hospitals have been the teaching hospitals and I am hopeful that the coöperation between hospitals which the Act seeks to secure, will lead to a greater utilization of the public hospitals for teaching purposes. Such a result would be in every way beneficial. It would provide more material for the student and particularly would tend to uplift and improve the personnel of the staff of the public hospital.

3. *To Make Public Health Available for the Whole Community Irrespective of Poverty*—This has been done by abolishing boards of guardians who previously administered Poor Law medical work and transferring their duties to the public health authorities. This transference of duties includes vaccination, domiciliary medical attendance for persons in receipt of Poor Law relief, and the maintenance of Poor Law hospitals. The public health authorities are further enabled to declare that all assistance provided by them is provided otherwise than by way of poor relief.

4. *To Maintain Health*—The Local Government Act introduces a further element into the matter of the maintenance of health. Under the Act local authorities receive block grants for many purposes, including health, and it is expressly stated that these grants are given on the definite understanding that a reasonable standard of efficiency and progress in the discharge of public health functions will be maintained by the local authority. It is further stated that the Minister of Health has power to reduce these grants if the health of the community or any section of the community is endangered or likely to be endangered by any action or want of action by the local authority. It will therefore be seen that there is a definite financial stimulus given to local authorities to do all in their power for the health of the communities they control.

It may be suggested that these very large provisions and concentrations in respect of public health and medical work made by the Local Government Act of 1929 are likely to lead to a state medical service. I should not be at all surprised if this were the result so far as the hospital service of the country was concerned, for it will be seen that the vast majority of the hospital beds in England is in the hands of the elected representatives of the people.

On the other hand the Local Government Act of 1929 does not interfere with the National Health Insurance Acts under which panel practice is conducted, the essential element of which is the private medical practitioner. Some 15,000,000 insured persons are catered for by some 15,000 doctors who are under contract to render treatment of a kind which can, consistently with the best interests of the patient, be properly undertaken by a general practitioner of ordinary professional competence and skill. This form of practice is in a sense a private medical practice in so far as there is free choice between doctor and patient, but it is also in a sense a State medical practice as part of the payment for the medical practitioners comes out of State moneys. As it stands the service is mainly, if not only, a general practitioner service and its extension, although it has been considered, has not matured. Extension is needed in respect of consultant and specialist services, a hospital service, a nursing service, and laboratory facilities for diagnosis and treatment.

The service and its projected extensions are concerned only with the cure of disease. Some insurance medical practitioners, however, are turning their attention to the prevention of disease. They are endeavoring to reduce sickness by the education of their panel patients in health. The patients are encouraged to seek the advice of their panel doctor as to how to keep well, to come to him without delay as soon as they feel unwell, and to undergo regular periodic overhauling at other times. In this way the doctor and patient coöperate toward the detection of disease in its early stages and the prevention of disease and the maintenance of health. The doctor recognizes that it is to his advantage to have no ill patients on his panel.

It may be that generations may elapse before a whole-time State medical service is established, if at all, but it is well to observe that the private doctor is being pressed increasingly into the service of the State. The bulk of general medical practitioners hold no office of profit directly under the Ministry of Health or local health authority but various Acts of Parliament place certain statutory obligations upon them. A general medical practitioner is liable under Statute in the following respects:

1. He must notify births within 36 hours.
2. He must certify stillbirths.
3. He must certify deaths.
4. He must notify cases of infectious disease.
5. He must notify cases of industrial poisoning.

In addition he may be called upon to perform any of the following duties:

6. To act as an insurance practitioner.
7. To provide medical assistance and treatment for the poorer inhabitants of the district in which he lives.
8. To act as a public vaccinator.
9. To act as certifying factory surgeon.
10. To certify insane persons.
11. To certify feeble-minded persons.
12. To act in an emergency when called in by a midwife, and from time to time to give certificates relative to the removal of infectious cases to hospital, disinfection, removal and burial of dead bodies, etc.

As a result of all these changes and State duties the general medical practitioner in England is becoming more and more alive to his responsibilities as a State medical practitioner. The importance of the prevention of disease is now taught him as a student on every possible occasion throughout his medical course. More recently the importance of public health as a subject in the medical curriculum has been considered. Public health was previously a subject relegated to a second place in most medical schools but is now receiving increasing attention.

THE TREND

I have indicated what are likely to be the immediate fruits of the Local Government Act of 1929. But to my mind what is most important about this Act is that it shows that the nation is conscious of the need for health and has declared for a policy of health. It is likely that this conscious declaration of policy by the government and local authorities will do more to stimulate public health progress than the passing of the Local Government Act itself.

One of the first results of the working of the Act will be that the government which already plays a part in promoting research will play an even greater part in the future, and that local authorities in England which do little if anything by way of research will be stimulated through the hospitals, and laboratories, and field work that they control, to take their share in this important development, for it is on the findings of research that all medical and public health progress is made. In Scotland a Scientific Advisory Committee on Medical Ad-

ministration and Investigation has been set up to advise the Scottish Board of Health. When the huge number of deaths per annum from heart disease, respiratory diseases, cancer, tuberculosis and diseases of the nervous system are remembered, it will be seen that there is much work for such a committee to do.

I have outlined to you what the present trend of public health in England is, but I am quite sure that the public whose consciousness of the need for health has been thoroughly aroused and whose elected representatives are acting with definite intent to secure health for the people will ask of the medical profession—"What must we do to be healthy?" It is, after all, that question which we who are the health advisers of local authorities must prepare ourselves to answer.

It is at this point that we turn to the physiologist and tell him that he must advise us as to what normal life processes are and as to the conditions under which they may be maintained. We appreciate that the earlier in life correct habits of living are inculcated the better and stronger and more resistant will be the adult product. It was for this reason that maternity and child welfare work was begun. It is true that we have antenatal clinics, but these clinics are designed more with the idea of protecting the mother in childbirth than of trying to secure that the child when born has been properly nurtured in the mother's womb. This conception of an antenatal clinic must be realized, for the processes of nutrition are profoundly affected during the antenatal period and in early life and good feeding and habits in later life will not wholly compensate for errors in the early stages.

We must come back to a study of the various processes of nutrition and learn the way of health. We must make an endeavor to recognize the essential processes which will make for healthy living, and ask the physiologist to become definitely a public health worker.

Recently a committee in England has been set up to advise the Minister of Health on how the recent advances in the science of nutrition can be best utilized in the interests of public health, and that committee is at work. It does not hope to accomplish the ideal of planning good health and continued good health for everyone, but I am quite sure that it will do something toward that end.

The Relation of Public Assistance to Public Health in England*

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FOR over 30 years I have been concerned with that section of public health administration in the County of London which is related to the provision and maintenance by the Metropolitan Asylums Board of public hospitals for infectious, children's, and mental diseases. Two years ago, however, when the work of the board was transferred to the London County Council, I entered on another phase of public work and undertook the organization and management of the new department formed by the County Council to take over the public assistance duties of the 25 separate boards of guardians of the poor till then functioning in London.

Public assistance in its widest meaning may be held to include all those services for the individual the cost of which is wholly or partly borne by public funds, i.e., national taxes and local rates. It includes the provision of houses, maternity and child welfare, education, unemployment pay, and the maintenance of health; it touches the life of the individual at almost all points from the cradle to the grave, and vast sums are spent on these services. I am using the term, however, in the more limited sense in which it is generally understood—the relief of destitution.

This considerable change in the orientation of my activities has enabled me to survey the familiar questions of public health from a new point of view. It is very stimulating to examine a well known landscape from a different standpoint and in a new light, and I trust that my first impressions of public assistance and my new reflections on problems which, as I gather, are likely to command increasing attention in the United States. I say this because the question of public assistance in your country appears to be coming into the field of current political thought and will, therefore, thrust itself to an increasing extent into your affairs as administrators of public health.

* Read before a Special Session of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 15, 1931.

Going from public health to public assistance as I have done, arouses at once a very strong feeling of travelling from a country which is comparatively new to one very much older, and necessarily much richer in history and traditions—some such feeling, in a sense, as is aroused in an American on his first visit to Europe. Let me give you an instance straight away. I undertook my new office at the beginning of 1930 and I found that the Act of Parliament with which I was mainly concerned was The Poor Law Act, 1930. The key section of that Act and the duty of the local authorities is as follows:

Section 15 (1) (a) (b)

To set to work all such persons, whether married or unmarried, as have no means to maintain themselves, and use no ordinary and daily trade of life to get their living by.

To provide for the necessary relief of the lame, impotent, old, blind and such other among them being poor and not able to work.

There is a rhythm and a style in the language which makes it completely different from the phraseology of modern statutes. You may possibly be reminded of the pleasant sensations that you enjoy when you raise to your lips a glass of '60 port, or of Napoleon brandy, if such a simile may be permitted in this assembly. If you are connoisseurs of literature you will no doubt say that that clause can only have been written at some time earlier than Milton and later than Sir Thomas Moore. The clause is, in fact, a quotation from the great 43d Act of Elizabeth and is dated 1601. The law of public assistance in England today is, therefore, in its basic elements the law instituted by the wisdom of Queen Elizabeth's famous group of councillors, among whom were men like William and Thomas Cecil, Francis Bacon and Edward Coke, whose fame is still familiar to the modern world.

While, however, public care for the health of the individual had its origin in Tudor times with public provision for the relief of destitution, its development is essentially a matter of the 19th century and after. It is true that a Mayor of Nottingham was presented at a Court for sundry misdemeanors in 1512 for starting a muck hill, and that Shakespeare's father was fined in 1552 for throwing rubbish into the street, but that was under local manorial bye-laws and neither the Queen's Ministers nor Parliament, though deeply concerned with the poor law, were called upon to consider any public measures dealing with sanitation.

Until the 16th century, the relief of indigence, including the care of the sick poor, was adequately provided by the various corporations that existed within the church, such as hospital foundations, almshouses and the services provided by monastic establishments. It was

ordained by Kings before the Conquest that the poor should be sustained by parsons, rectors and the parishioners "so that no one shall die for lack of sustenance." The primary effect of the reformation, however, was to make the Church in England into the national English church and it followed that the organization of help for the poor became a matter for the national government. This is why the legislature at the end of Queen Elizabeth's reign passed the Act already referred to which commanded the local parochial units to raise funds and appoint officers for providing relief for poor persons who were not able to work and for the sick. There seems little doubt that the function of the central government was to secure the passing of laws and that it had no regular machinery for controlling local administration. The actual provision, therefore, for the sick and poor continued to be a parochial affair, and there were naturally great diversities of treatment, ranging from many admirable experiments down to many grave abuses.

Relief given was necessarily either institutional or domiciliary. In the case of sick people, institutional care was usually provided in the mixed workhouses. If the sick could be looked after in their own homes, they were attended and "physicked" by the parish doctor.

Perhaps the most significant of the changes made by the great Poor Law Amendment Act of 1834 was the establishment for the first time in English local government of the principle of central executive control over local administration, or, in other words the institution of a central body and the appointment of inspectors, thereby converting the administration of the poor law into a function of the national government. The local units of administration were inevitably and properly retained for a service which is intensely local in its incidence, but it was found that the drastic reforms necessary and the maintenance of an adequately high standard of administration required the direction of a central authority.

After 1834 there arose a noticeable appreciation of the extent to which poverty in many cases was dependent on health. The Poor Law Commissioners reported that

... prominent and pressing were the means of averting the charges on the poor rates which are caused by nuisances by which contagion is generated and persons are reduced to destitution. All epidemics and all infectious diseases are attended with charges immediate and ultimate on the poor rates . . . the amount of the burden this produces is frequently so great as to render it good economy on the part of the administrators of the poor laws to incur the charges for preventing the evils where they are ascribable to physical causes.

As a result of this changed outlook, to which impetus was given by the humanitarian reaction following the evils consequent upon the indus-

trial developments and the uncontrolled movement from country to town during the first quarter of the century, the Royal Commission which led to the passing of the Poor Law Reform Act of 1834 was followed by another Commission on the Health of Towns and Populous Places. This body reported in 1845 and there followed the passing of the first Public Health Act of 1848—the “ground work of sanitary legislation.” The movement owed its initiation to the same group of thinkers and administrators, of whom Bentham and Chadwick were the best known names, which had inspired the reform of the poor law. Not unnaturally the leading feature of this change was the institution for public health also of a central authority, which from the beginning took and kept a leading part in the development of public sanitation. The local sanitary work was entrusted to the town councils and thus began another local and independent health service working on very different principles from those inspiring the ancient poor law services.

Unlike the poor law board, the central public health authority came into existence not to reform what was already there but to create a new thing. This different attitude has persisted until today, and I think that on reflection we shall find that this is necessarily so. The demand for public assistance grows up from below, but public sanitation has to be imposed from above. To put it in a very homely way, if a man is hungry he asks for food, but if he is dirty he has to be told that he ought to wash. The dirty man who asks for a bath is the product of an educational process which has been initiated from above. To take an even more homely example, it is a common experience that the small male animal of the human species readily displays his willingness to eat as much as he can get, but one of your own cartoonists has impressed on us the truth that small boys display a remarkable ingenuity in delaying or avoiding ablution.

To revert to a more official statement of the position—the central authority has found it constantly necessary to restrain local units of government from giving public assistance too freely, whereas a central authority has constantly had to stimulate local units of government to show more activity in providing sanitary services, and for some decades now it has been the custom of Parliament to make percentage grants from public funds toward the expenditure of local authorities in order deliberately to encourage such local authorities to spend more and more on public health.

You will have observed that hitherto I have spoken of public health as the equivalent of public sanitation and that, apart from the cure of the destitute sick, was its content, but, by 1875, England was thoroughly educated in the appreciation of sanitation. Disraeli was

able to make the epigram when he introduced his great Public Health Act of 1875 "*Sanitas sanitatum, omnia sanitas.*" Englishmen were wont with no little complacency to boast about their Doultonware, the evangelizing qualities of Pear's soap, and the triumphs of the plumber's science in our cities and towns. Public health at this time was indeed largely a matter of pipes. Pipes to bring clean water, drain pipes and sewage pipes performing their unseen cleansing tasks, and large tubular pipes in the form of chimneys to cast in the face of an affronted heaven the black clouds of smoke that were the celestial sign of our abounding industrial prosperity.

Since the beginning of the twentieth century, however, public health administration has extended its scope very widely beyond the limits of sanitation as ordinarily understood. Instead of being mainly concerned with all those measures, multifarious as they are, which are necessary to prevent infectious diseases and other menaces to the health of the community, public health administrators are reverting to the first conception and are becoming more and more concerned with the personal health of individual members of the population. An example of this shifting of the point of stress is shown by the fever hospitals of London which were provided in order to isolate persons suffering from infectious disease, with a view to checking the spread of such disease throughout the city. A continuous and candid examination of the facts, however, revealed that such isolation did not really affect the spread, or otherwise, of the disease and that the provision made was really fulfilling the service of giving to each individual sufferer the care and cure which he would have found it difficult to obtain in his own home without such public aid. The Metropolitan Asylums Board, therefore, led the way in providing what the Webbs in their *English Local Government* describe as the magnificent hospital system which afforded treatment for individuals who were suffering from diseases requiring the specialized knowledge and equipment which could only be provided by a large authority working on progressive lines.

What was described by the Minister of Health responsible for the measure as the greatest change in English local government for the years was brought about by the Local Government Act, 1929, which came into force on April 1, 1930. References to various aspects of this great measure from different angles will no doubt be made by my British medical colleagues at this meeting. It is enough for me to point out that it swept away the boards of guardians of the poor and handed over practically all their duties to the county and county borough councils. The most difficult and thankless of these duties was undoubtedly the granting of domiciliary or outdoor relief on other

than health grounds, especially to the able-bodied, a problem which appears merely to increase in difficulty with the passage of time. That part of the change with which public health administrators are concerned is the one which for the first time brought the two public medical services under one control in each area. In London (and generally throughout the country) the Public Assistance Committee of the Council is charged with the relief of destitution and the Public Health Committee with the management of the hospitals and with the control of all medical and nursing working. The principal points of contact are (1) in the provision of domiciliary medical relief, and (2) in the arrangements for the admission of destitute patients into hospital.

The county is divided into districts, each with its district medical officer who is for the most part a general practitioner in the neighborhood and whose duties involve attending the destitute patient in his home or at the medical relief station or dispensary of the district. The district sub-committees administering relief, of which there are 74 in London, receive the reports and recommendations of the district medical officer in all cases of persons receiving out-relief requiring medical attention and special care or nourishment in their homes. In the case of able-bodied men who as a condition of receiving out-relief are required to attend work or training centers, an examination by the district medical officer is a necessary preliminary to such attendance. In London the number of visits to the homes of patients paid by the district medical officers in the year ended September, 1930, was 60,000 and the number of patients' attendances at medical relief stations was about 230,000. In the whole country there are some 4,000 district medical officers.

With regard to the hospitals provided out of public funds, these, up to the 1930 change, had been almost entirely established by the guardians of the poor, and in modern times the sick wards of the general workhouses had developed in many parts of the county into first class hospitals. Even with the hospitals of the Metropolitan Asylums Board in London, it is true to say of every disease admissible that the admissions started with and were limited to the destitute class and that in the natural order of things it was found necessary to make the need for treatment rather than lack of means the basis of admission, and the legal limitation on admission was removed.

It was scarcely likely that public opinion would rest content in the case of the guardians' hospitals that a relieving officer's certificate should be the open sesame and that destitution should be the sole qualification for admission. So in these hospitals too, the necessary qualification of destitution had for a long period been so widely in-

terpreted that it included many who would have been excluded by a strict application. With the Act of 1930 came the transfer of all these hospitals to the county and county borough councils, and this naturally means the transformation of the guardians' hospitals into municipal general hospitals and the opening of their doors to the general public. The London County Council is now responsible for some 100,000 beds of all kinds and the individual citizen, therefore, has a wide range of public resources from which to draw—not only for infectious and mental diseases but also in respect of what the ancient Greek would have called his "self-regarding" necessities.

It is not unnatural that, when charitable people provide something that is really very good with the intention that it shall be used for the very poor, the ultimate fate of such good things is to be used by better-to-do people who have the intelligence and energy to appropriate them, and it is often said that this has been the fate of some of our most ancient educational foundations. This process should be less facile with public control, but it will need the vigilance of the local authority to insure the observance of the right of prior admission which the Act of 1929 gives to the destitute poor for whom the hospitals were first provided and by whom they have so far been filled. At the same time it will have to meet the new demands from classes ranging above the poverty line, certainly up to the lower middle classes, which need ampler hospital facilities. In a word, we have to reconcile the view of the President of the English Society of Medical Officers of Health of last year who wants "to get and cater for the respectable, independent, middle, or lower middle and working classes who cannot afford the private nursing home and do not like charity" and that of the late Lord Knutsford, one of the outstanding figures in the English hospital world to whose personality is very largely due the re-creation of the London Hospital with its 800 beds, flourishing medical colleges, laboratories, nursing training school and so forth. Lord Knutsford died in the hospital and the comment was widely heard that this was a fitting end. But when the surgeons insisted on his removal to hospital he made the characteristic reply "The hospital is for the sick poor and not for the likes of me."

Very closely linked up with this question is that of payment according to means for hospital treatment. The old poor law regarded the family as a unit and provided that

... it shall be the duty of the father, grandfather, mother, grandmother, husband or child of a poor, old, blind, lame or impotent person or other poor person not able to work if possessed of sufficient means, to relieve and maintain that person and the authorities were entitled to obtain orders of maintenance

against the liable relatives. This right to recover from liable relatives the whole of the expenses of maintenance, or such part as in the opinion of the authorities they are able to pay, is renewed in the Act of 1929. The London County Council have taken the view that the duty of assessing and collecting contributions from those who receive

. . . services rendered or relief granted out of rates or taxes to an individual or family upon an examination of the economic or other circumstances of their case, including relief in all forms, maintenance and treatment in hospitals and institutions (except for infectious disease)

shall be concentrated in a single department and that the Public Assistance Department. This may seem to run counter to the views of those who claim that the change was intended to depauperize sickness and remove the stigma of pauperism by which is meant the interposition of the relieving officer and inquisition as to means. But a change of words does not involve a change of things, and any limitation as to means put on admission to the hospitals must involve the ascertainment of the facts. Similarly, whatever officer has the duty of ascertaining the facts and collecting payment, will have to make inquiries similar to those now made by the Public Assistance Department and will be no more popular than any other official who has been charged with those duties in the past. I doubt whether the stigma of pauperism lies in the fact that inquiries as to means are made, nor in the particular title of the officer making the inquiries. A more fundamental reason must be found, and I think it lies in the fact that until recently the only people who received that form of state assistance based on the ascertainment of needs, which was called poor law relief, were a limited number of the very poorest of the community, the class which included the dirty and ignorant, the ill-mannered and depraved. The "paupers" were a class apart from the rest of the community, losing all links with normal life and, if in institutions, they were known by their apparel. They were regarded as a class to be deterred and the spirit of deterrence even entered into the question of medical needs.

The idea of stigma, aged and deeply rooted, cannot therefore be wondered at, but the public attitude toward poverty has greatly changed. In the first place the numbers of necessitous persons are actually and relatively so much greater that they cannot be regarded as a separate class or as abnormal cases. Recourse is had to relief just as to other forms of social assistance, and the principle of deterrence is now less openly proclaimed, if not forgotten.

The transfer of the poor law services to an elaborate organization of government such as the county councils means the administration of what has for centuries remained essentially a separate service in con-

junction with other services of more recent origin destined to meet requirements which are the product of an ever increasing complexity of social organization. The reorganization of public assistance in co-operation with these other services should enable it to become more scientific in method and constructive in purpose than in the past, and in no branch of public assistance more than on the medical side.

I will close by touching very briefly one or two other considerations affecting public assistance and public health. In industry by rationalization and by the trend toward public utility companies, in the home life by the increasing volume of public services paid for by public funds, the tendency is to supplant individual by communal effort. The spirit of deterrence which marked the old poor law was perhaps the offspring of individualism in its extreme form. Benjamin Franklin when visiting London in 1766 said

. . . The day you passed that Act (43 Elizabeth) you took away from before their eyes the greatest of all inducements to industry, frugality and sobriety, by giving them a dependence on something else than a careful accumulation during youth and health for support in age and sickness. I think the best way of doing good to the poor is not by making them easy in poverty, but leading or driving them out of poverty. In my youth I travelled much and I observed in different countries that the more public provisions were made for the poor, the less they provided for themselves and of course became poorer . . . There is no country in the world where so many provisions are established for them, so many hospitals, so many almshouses . . . in short you offered a premium for the encouragement of idleness and you should not wonder now that it has had its effect in the increase of poverty.

If, as I think is true, the stigma of pauperism is dying out it is not because there is less but because there is more recourse to public assistance in one form or another and because the vast and rapid extension of public assistance in forms other than poor relief indicates a fundamental change in the relation between the state and the individual. That the developments in question were themselves inspired by a desire to prevent "pauperism" cannot disguise the fact that they make substantial calls on the public purse under various names while the sanguine hope expressed at each successive stage of social amelioration that poor relief would be *pro tanto* successively reduced, is not yet realized.

The problem of how the community is to provide for the needs for which the individual cannot provide, and which the public conscience demands should be met, without creating a universal spirit of dependence and stimulating the demand for public assistance by each new provision of it—without, in other words, yielding up the freedom of a strong and virile people—was never more insistent on the attention of the man in the street and of the statesmen in the cabinet than in the

present day. In the solution of the problem, public assistance and public health administrators can in coöperation play a large part. The public assistance side has, perhaps, the less popular rôle of emphasizing that the family unit is still the prime factor in our social structure; that running through all our social legislation in the past has been the theory that it is the duty of the family to help any member who falls into need or distress of any kind; and that this is true of sickness as of any other of the hardships of human life, against which the family is the natural protector.

If public assistance tries to preach economic wisdom, it will not, it is true, receive the applause of the market place but it may deserve the approbation of the judicious. I notice with great interest that the charitable social work which in many parts of the United States fulfils the function of the English poor law is carried out by societies which use the title of Family Societies, and that the gentlemen in the United States who may be said to correspond with the English relieving officers, are known as Family Rehabilitation officers. I must admit that we should want some acclimatizing even to the modest addition of "F" to the familiar initials of "R. O."; but behind the question of title there lies again the principle that public assistance administration should follow up all the numerous channels through which state and municipal help and specialized treatment are given to individual members of family groups and should still hold before each family the sense of its corporate existence and the idea of mutual help and independence.

Public Health Service in Britain Education and Training*

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THE orientation of the public health organization in Britain is more definitely medical than is the case perhaps anywhere in the universe. Even before it was solidly established by the Public Health Act, 1875, and the medical character firmly and legally was conferred upon it, the intention that it should be so was clearly shown. Numbers of sanitary and health bodies throughout the country, conspicuously in London and Liverpool, recognizing this intention, early in the 19th century appointed medical officers, the example they set being followed soon by others. In the Acts of Parliament empowering such appointments references were made to non-medically qualified officers—surveyors or engineers and inspectors of nuisances or sanitary inspectors. In spite of this, however, and the outstanding importance of the work that experts in engineering and such like matters could perform at that date, the view apparently taken was that the assistance really required was such as could be provided by individuals trained and qualified in medicine. When the Act of 1875 came into operation no room for doubt upon this point was left.

THE MEDICAL OFFICER OF HEALTH

The authorities declared responsible for health conditions in the various parts of the country—named by the way “sanitary authorities” in this connection—had specifically imposed upon them the duty of appointment, first and foremost, of a person fit and proper to be a medical officer of health, and secondarily others, also fit and proper, to be inspectors of nuisances, surveyors, etc. Going further, the Act laid down certain provisions with regard to the qualifications of the medical officer of health, forbidding at once the appointment of any person to the post unless a legally qualified practitioner.

At this time there was no call for any particular qualification in the case of the other officers mentioned, i.e., the inspectors and the sur-

* Read before a Special Session of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 15, 1931.

veyors. For that matter there was not then any actual reference to qualifications additional to those usually possessed by medical practitioners in the case of the medical officer himself. Various of the universities and medical schools, however, recognized the need for additional training and set about providing it, with, at the end, the inevitable examination and a degree or a diploma conferred upon such as complied with the rules of the teaching bodies and satisfied the examiners. The object of the teaching and examining bodies was, avowedly, to assist the government and the local sanitary authorities and in due course this was so very definitely recognized that there was introduced into an act of parliament having specific reference to local government (The Local Government Act, 1888) a provision that in no county or district with a population of 50,000 or more shall a person act as medical officer of health unless he has held certain offices, or in addition to a medical qualification holds and is legally qualified and registered as the holder of a diploma in sanitary science, public health or state medicine.

These expressions were used for the reason that the qualifications offered by the teaching and examining bodies were a doctorate in state medicine, in the case of London University particularly, a bachelorship in the science of public health (University of Edinburgh, Glasgow, etc.), and a diploma in public health by various examining bodies and universities.

The qualification being a registrable one the matter became a concern of the General Medical Council of Great Britain, and in due course this body laid down, and from time to time since has revised and amended, certain rules regarding the teaching and examining of persons for diplomas designed to secure that there shall be registered only such diplomas as are granted under conditions of education and examination satisfactory to the council.

EXAMINATION FOR QUALIFICATION

These examinations for degrees or diplomas in public health are not state affairs; nor are they conducted by or under the auspices of a civil service commission. The General Medical Council is, however, a statutory body and wonderfully powerful so far as regards the enforcing of any rules it may lay down upon institutions and bodies that set themselves up to provide education or carry out examinations. The approval of the council must be secured by those who teach and they must provide at least the minimum amount of instruction prescribed. The examining bodies must also comply, and the examinations they conduct are open to supervision and from time to time are supervised by representatives of the General Medical Council.

One of the advantages which this system appears to possess over the civil service commission examination is that the candidate is tested not merely for an appointment but to discover if the degree of his training and education is sufficient to justify certification of fitness for engagement in the work of the position. A prominence, therefore, it may be presumed is given to the training and education; and those concerned in examining, as well as those engaged in attending to the teaching, are encouraged to make improvements and to look for directions in which advances may be made. In Great Britain certainly, there have been such effects upon the two bodies named. Upon the General Medical Council, the body dictating to the others, there has been an effect of stimulation also, as shown by the frequency with which rules have been revised, always in the direction of increasing the stringency, requiring a higher and higher degree of efficiency in the teaching bodies, of the students attending the courses, and in the examinations.

EDUCATION AND TRAINING

As a fact, within the space of a comparatively few years such changes have taken place that practically necessitate the devotion by candidates for degrees or diplomas of whole time for a period of 12 months (2 years in the case of degrees) after they have secured a medical qualification and given, at least, 1 year to medical practice.

As showing the readiness of teaching and examining bodies to encourage advance, the case of the London School of Hygiene and Tropical Medicine and the University of London may be quoted. Opened only 2 years ago, the school provides today a course in public health and preventive medicine which, though designed to meet the requirements of the General Medical Council, covers ground infinitely wider than is called for by that body in which there is a coördination of subjects, and among the teachers to a degree not previously attempted in Great Britain certainly, and probably not anywhere else. In the course the attention devoted to field work, though considerable, is perhaps less than in other schools, much more time being given to a consideration and discussion of various aspects of preventive and public health work by specialists engaged in field or research work.

Among subjects dealt with in the session 1930-1931 under the scheme may be noted a series on Psychology by Professor Millais Culpin, recently appointed a member of the staff of the school as Professor of Medical Industrial Psychology; lectures on diseases common to man and animals; on the Laws of Inheritance by Professor Crew of Edinburgh University; on International Hygiene by Sir George Bu-

chanan; on Industrial Hygiene by Sir Thomas Legge, Professor Collis, and others.

The examination provided by the University of London is conducted in such a way as not only to comply with the rules of the General Medical Council but also to place it on a level as high as that reached by the teaching. The qualification awarded is in the form of a diploma, though it may be noted that the university also grants a degree in the shape of a doctorate in state medicine, open to graduates in medicine of the university and holders of the bachelorship of medicine.

EXAMINING BODIES

Apart from the university there is in London an examining body set up jointly by the Royal College of Physicians of London and the Royal College of Surgeons of England.

Outside London the examinations held are conducted by various of the universities. In Scotland, in addition to the universities, there is in existence a conjoint board of the colleges and faculties in Edinburgh and Glasgow similar to that examining in London. Not all of those who take the course of study sit the examination, the number of candidates annually in London alone being somewhere in the neighborhood of 150. Of these, at the first attempt, approximately two-thirds qualify for the degree or diploma.

In the provinces the number sitting is probably much less. Some of those who secure a qualification have no intention of entering the preventive medical service; others seek appointments abroad, and the remainder, the minority it may be, endeavor to enter the home service, competing for the occasional vacancies that occur in the various branches, and those, in the case, at any rate, of medical officer of health posts, must by law be thrown open to all who are qualified, through a public advertisement issued by the appointing authority who selects the person preferred after a series of interviews.

Before the officer can begin to operate, his appointment must be approved by the Minister of Health, the reason for this interference being that some part of the salary of the officer is paid out of central government funds. This is regarded, in the case of the medical officer of health at least, as giving the government a degree of control and making the officer liable to an extent to act in a national as well as a local capacity.

The other medical officers serving in departments and branches of public health and preventive medicine, even though their duties may be largely clinical, are commonly expected to hold the ordinary public

health qualifications. Quite usually they are offered by the candidates, many of whom anticipate securing higher administrative positions. Recently in certain branches additional qualifications or training have been demanded by the minister. To these reference is made later, the intention at the moment being to discuss questions affecting the education and qualification of certain non-medical sanitary health officers.

THE SANITARY INSPECTOR A HEALTH OFFICER

Of these the first to be referred to is the sanitary inspector, partly because the office was created at or about the same time as that of the medical officer of health, with whom he shares the distinction of being statutory. As in the case of the medical officer of health, his appointment is compulsory upon the local sanitary authority, who may only choose a person qualified in accordance with rules of the minister of health, who must also approve the officer chosen.

The sanitary inspector, it is recognized, is an officer peculiarly British, being found in most parts of the Empire. In some countries there exists, I am aware, a feeling more or less of contempt for the type of work that the inspector does or is supposed to do. To my mind, and speaking out of a very considerable experience, this contempt both for the work and the officers can be carried too far. Without hesitation I say that the public health owes a very great debt of gratitude to sanitary inspectors, is still in their debt, and likely so to continue for a very long time. Also I believe those who in Britain linked the inspector with the medical health officer, made his appointment statutory and compulsory, and provided for the imposition of conditions in relation to qualifications, were blessed with vision. The one mistake made was in regard to the name applied to the office, although it is very difficult to suggest an alternative to "inspector," which is the part of the title that appears most objectionable and in general most inaccurate.

At first the requirements imposed in respect of qualifications were a little vague, but as a result of demands on the part of the inspectors themselves for instruction, and a willingness on that of the medical officers of health and other members of local authorities' staffs—engineering, legal, etc.—to provide instruction, the type of qualification required soon came to be recognized. Early in the field in this connection, with the providing of assistance to the authorities so far as the selection of suitable officers was concerned, by arranging for the holding of examinations and the granting of certificates, was the Royal Sanitary Institute. In due course this became the standard qualifica-

tion and throughout the country teaching institutions—the schools of technology, and in some places the universities—arranged courses of instruction for individuals desirous of sitting the examination and taking the certificate which might assist in securing appointment. Actually no qualification was specified by the central authority as essential to insure approval to an appointment made by a local authority, except in the case of London, until after the close of the Great War.

It was hopeless, however, for any individual to expect to be appointed who did not hold the certificate of the Royal Sanitary Institute, with, in addition, educational certificates of various kinds in respect of hygiene, physiology, and technical subjects, such as building construction. With the advances that occurred in connection with public health and preventive medicine, and for which he was to some extent responsible, the sanitary inspector kept steady pace. The grade of man adopting the vocation rose so high that it was found possible to give him greater responsibilities, and to entrust to him work of importance from the preventive point of view; in connection, for example, with epidemiology, food supervision, and so on.

Following such increases in responsibility and improvements in position came a recognition of the need for a qualification more specific and even higher than those already more or less accepted. In the demand for the qualification none were more insistent than the officers themselves individually and through their organizations. In meeting the demand no attempt was made to set up anything in the nature of a state examination. Instead the Minister of Health called upon the Royal Sanitary Institute and a body known as the Sanitary Inspectors' Examination Board which existed for the purpose of examining persons seeking appointments in London to unite and form a joint examination board. Having secured agreement on the part of these bodies, the Minister issued an order declaring no person qualified for appointment as sanitary inspector unless he was the holder of the board's certificate. The drawing up of the syllabus of the examination, the laying down of the conditions governing the examination, and the actual holding of the examination, the Minister left to the board, reserving only to himself the right to nominate a certain number of representatives. No payments out of government funds are made to the board in spite of the fact that the work done is obviously of the utmost national importance.

EDUCATION AND TRAINING

The teaching and training of persons desirous of sitting the examination is carried out in various institutions throughout the country

and in London. The course of instruction offered must be approved by the board, who insist upon a considerable amount of practical training in the field and of specific teaching by medical health officers.

The method of securing appointment as sanitary inspector is similar to that described in the case of medical officers, the supply here being probably even more in excess of the demand.

The Royal Sanitary Institute with the coming into existence of the Joint Board ceased to be an examining body for inspectors' certificates qualifying for appointment in England and Wales. So far as other parts of the Empire are concerned, however, its activities continue to be as extensive as ever. In certain parts indeed they are greater, e.g., in South Africa and in India, where, acting along with the government of the country in question, they set up joint boards and issue the only certificate receiving recognition. In certain provinces of Canada, in Australia, in New Zealand, in Singapore and the East, in West and East Africa, and the West Indies, there are examining boards, all of them in close coöperation with the Council of the Institute in London, who issue no certificate until the work and results of the examination have undergone scrutiny at headquarters.

WOMEN HEALTH WORKERS—THE HEALTH VISITOR

The faith and belief in the Royal Sanitary Institute throughout the Empire is immense; and it does not, at home, share the fate of the prophets in being without honor. The respect in which it is held is very great, and the extent to which the Ministry of Health and the local health authorities are prepared to trust and rely upon it practically unbounded. The part played in relation to the examination of sanitary inspectors has been explained. In the case of the other non-medical worker in the health department of the local authorities—the health visitor—the part is even greater.

Woman, in Britain at any rate, did not join the team of the public health department till about the end of last century. At that time, in order that she might have an official position and possess various powers of entry to premises and of taking action, she joined as a sanitary inspector, having sat the various examinations and secured the necessary qualifications. Once in office the woman showed her real value and importance and in a very short time all subterfuges were dropped and she was given a definite place in the organization. The title "health visitor" was coined for her, and the Royal Sanitary Institute undertook to hold examinations for the health visitor's certificate and issued a syllabus upon which various institutions in London and the provinces based courses of training.

As far as possible the institute sought to limit entries to women who had qualified as nurses or midwives, or both; but because the calling of health visitor was so attractive to women desirous of doing work of a social kind, provision had to be made for the training and examination of these and certain institutions of standing arranged to meet the need.

Arrangements of this kind continued to operate until the end of 1918, when the need was recognized for a single portal of entry to the profession of health visitor and for one examination qualifying for the certificate without which no woman was eligible for appointment under a scheme of maternity and child welfare to which the Ministry of Health made financial contribution.

As in the case of the sanitary inspector, the Minister turned once more to the Royal Sanitary Institute, and in due course a special board was established to conduct the examinations and to issue a syllabus of subjects for the guidance of training institutions and candidates. The Minister of Health himself issued various rules and regulations and laid down certain conditions that must be complied with before candidates could sit at the examination. Broadly there are 2 classes, (1) nurses who have completed a 3-years course of training either at a recognized general hospital or a recognized children's hospital, who have obtained the certificate of the Central Midwives Board, and who have attended an approved whole-time course in public health work lasting for at least 6 months; and (2) women, not being trained nurses, who have undergone an approved course of training in public health work extending over 2 years, together with 6 months' training in hospital, and who have obtained the certificate of the Central Midwives Board, without which, of course, no one other than a medical practitioner may practise as a midwife. All entrants to the service today whether trained nurses or not must take a whole-time course of instruction.

TEACHING AND TRAINING

The institutions providing facilities for training number round about a dozen, about half being in London and the remainder in various provincial centers. In all cases practical training is compulsory, and arrangements are made for this to accompany the more theoretical lectures and instruction at selected maternity and child welfare centers.

In some districts, the county of Durham particularly, arrangements are made for providing the teaching and training, while the student is working and receiving a certain amount of pay as probationary health visitor in the health department. The service given in these cases is regarded as payment made for the teaching provided. In other cases

the students themselves pay the necessary fees which are comparatively small by reason of the fact that the Ministry of Health makes a grant to the teaching institutions toward the cost of the training of each of the students. The fee for the examination is paid by the candidate. The examination is of a very searching character and consists of 3 written papers, each candidate being examined orally also by a board consisting of at least 3 examiners, 2 of whom are medical officers of health, and 1 a health visitor.

From time to time the examination is supervised by an officer of the Ministry of Health. When the rules and regulations of the Minister with regard to the examination were first introduced, it was felt that on account of their stringency they might lead to a serious reduction in the number of women seeking to qualify as health visitors.

Events have shown this fear to be without foundation, the numbers attending the recognized courses and facing the examiners being much more than adequate to meet the needs of the local health authorities. At the moment at least this is the case, and if in future there should be any falling off it will be the result rather of the unsatisfactory conditions as regards pay than of stringency in regard to training and examination.

THE POST OF HEALTH VISITOR

Having regard to the fact that the official title of this officer is very peculiarly British, perhaps it should be explained that mainly the health visitor is engaged in performing duties that do not involve actual nursing. She is defined indeed in the Local Government Order, 1930 (*Qualifications of Medical Officers and Health Visitors*), as a woman whose duties include the visiting of women and children in their homes for the purpose of giving advice as to the nurture, care and management of young children, and as to the health of expectant and nursing mothers. By health authorities, some nurses are, of course, employed, who work among school children, for example, and others who carry out more or less of what is called district nursing among persons not removed to hospital. Staffs of nurses for attending to patients suffering from infectious disease are attached to isolation hospitals. In most districts infectious cases are only exceptionally nursed at home.

The practice of calling upon one woman to double the parts of nurse and health visitor is followed in a small number of places, and in these there has been some sort of inclination to adopt the official title of public health nurse. Neither the practice nor the title, however, has been generally accepted, nor indeed are they regarded with favor. Despite the efforts of an odd body or medical officer of health

here and there, it appears certain that the older and less cumbersome and more accurate name "health visitor" will be retained. It is a fact, of course, that in the homes and by the people the woman is most commonly addressed as "nurse," but, by the same token, the sanitary inspector is rarely if ever called by that name, so that it would appear to matter little to anybody but the stickler exactly what they are called. I am a stickler and I like "health visitor."

So apparently does the Minister of Health, for in an order issued at the beginning of last year under powers granted to him in the Local Government Act, 1929, he uses it again in indicating to local health authorities that any person appointed to such a post must be a woman who, prior to April 1, 1930, has held the appointment of health visitor with the approval of the Minister, or who has obtained the health visitor's certificate issued by the Royal Sanitary Institute.

THE TUBERCULOSIS VISITOR

In the same order reference is made to another woman visitor as well as to certain medical officers who must or may be appointed by local health authorities. The particular visitor mentioned is the "tuberculosis visitor" whose duties in the main lie in relation to the tuberculosis dispensary and the homes of persons attending the institution or who are notified as suffering from tuberculosis. The purpose of her visits according to the definition is the giving of advice as to the care and hygiene of persons suffering from tuberculosis, and as to the measures necessary to prevent spread of infection.

The kind of woman suitable for the position is one who has obtained the health visitor's certificate or who is a fully trained nurse and has had at least 3 months' special experience at a sanatorium or hospital for the treatment of tuberculosis, or at a tuberculosis dispensary. In the Ministry order it is stated in fact that only exceptionally will an appointment by an authority of any person not so qualified be approved. The importance of the approval of the Minister to an appointment lies in this—without it no financial assistance will be given to the authority by the Minister toward the payment of the salary of the officer. In addition, of course, by laying down requirements as to qualification in orders and regulations the Minister insures that trained officers only shall be employed, creates a demand for training, and encourages teaching institutions to provide the courses of training.

VARIOUS MEDICAL OFFICERS

In addition to health visitors and tuberculosis visitors, as already noted, the regulations of the Minister issued in 1930 contain reference

to various medical officers who of recent years have joined the public health department organization of the local authorities to attend to particular sections of the population and to deal with particular diseases. In each case special qualifications and expert knowledge and skill are required, and it is in order to insure that local authorities shall appoint none but individuals specially qualified that the Minister has laid down his rules. The officers referred to in the order include a tuberculosis officer or medical superintendent, a venereal diseases pathologist, a venereal diseases officer, a senior maternity and child welfare officer, and a medical officer of an antenatal clinic.

Tuberculosis Officer—The requirements in regard to the tuberculosis officer or medical superintendent—meaning by the latter a medical officer in clinical charge of a residential institution for the treatment of patients suffering from tuberculosis in the early or curative stages of the disease, which contains not less than 75 beds, are (1) that they shall have had at least 3 years' experience in the practice of their profession, (2) have spent in general clinical work a period of not less than 18 months, of which not less than 6 must have been spent in a hospital as resident officer in charge of beds occupied by general medical or surgical cases, and (3) have received special training for a period of not less than 6 months in the diagnosis and treatment of tuberculosis.

Venereal Diseases Officer—The person appointed venereal diseases pathologist must also have had 3 years in practice, but in addition must possess a certificate given by a pathologist in charge of a laboratory approved by the Minister of Health, testifying that, under his supervision, the person, within the preceding 2 years, (a) has personally carried out not less than 500 serum tests for syphilis by a method approved by the Minister and is competent to perform such tests, and (b) has personally examined microscopically not less than 300 specimens from lesions suspected to be syphilitic, gonorrheal, or chancroidal, and is competent to conduct such examinations.

The qualifications for a venereal diseases officer, in addition to the 3 years' professional practice, are that he must be in possession of a certificate given by a venereal diseases officer of a treatment center at which not less than 500 patients attended for the first time during the 12 months preceding the issue of the certificate, testifying that he has attended at the treatment center for a period of not less than 3 months, and has received during that period not less than 130 hours' instruction in the modern methods of diagnosis and treatment of venereal disease.

Maternity and Child Welfare Officers—A person appointed senior maternity and child welfare officer must be in a position to show

either that he has held such a post with the approval of the Minister prior to April 1, 1930, or that in addition to 3 years' professional practice he has had special experience in midwifery and child welfare work and has been employed by a local authority under the Maternity and Child Welfare Act.

The conditions in the case of the medical officer of an antenatal clinic are that the person shall either have held an appointment approved by the Minister prior to April 1, 1930, or subsequent to qualification have had 3 years' professional practice and special experience of midwifery and antenatal work.

In the main, in these cases it is practical experience that is required; and in most instances that experience can only be obtained in the service of a local authority or in a special institution. The difficulty of securing it in certain cases is considerable, but actually there is no shortage in the supply of officers required.

Veterinary and Food Officers—The lists and descriptions given do not quite exhaust the number of officers included in the team of health workers engaged in or actually attached to the public health department of the local authority possessed of a reasonably complete organization. In Britain, even in quite large districts, the "bureau" system as it is seen in other countries and which, *prima facie* at any rate, suggests the existence of water-tight compartments, is not recognized. The medical officer of health being an executive and working officer is given general supervision of and responsibility for the whole department, the persons in charge of the various branches of work being responsible to him.

Among such individuals, in addition to those mentioned, there will be an officer in charge of food and veterinary work, who will necessarily and naturally be a qualified veterinarian. No special qualifications, apart from those of a veterinary surgeon, are laid down for this officer though very many have undergone special training at universities and veterinary colleges, and have secured special diplomas in veterinary hygiene. Control of the food supply, meat in particular, is part of the duties of such officers, though it must be noted that the sanitary inspector, having by law powers of inspection, seizure, etc., of food, has a certain position in this connection though occasionally he works under the veterinary officer as an inspector of food. Special courses of training in meat and food inspection are provided by a number of bodies throughout the country, and in London notably by the Royal Sanitary Institute. This body, after examination, grants a certificate of competence to act as inspector of meat and foods, which is very highly valued and approved by the Ministry of Health. Only persons who have un-

dergone the specific training and who comply with certain conditions, among them that they possess the certificate of qualification to act as a sanitary inspector, are admitted to the examinations. These, like those for sanitary inspectors and health visitors, are held at various centers throughout the country in addition to such as are held in London at regular intervals.

THE SCHOOL MEDICAL SERVICE

The School Medical Officer—The medical officer of health to a local authority is commonly the medical officer to the education authority of the district also, and is responsible for the medical inspection, supervision, etc., of the school children in the area. The staff required for these purposes depends upon the size of the school population but in addition to medical members includes also nurses. No special qualifications are prescribed for these officers, but so far as the medical members are concerned those who are appointed assistants generally possess a degree or diploma in public health, and use the appointment—as do very many of the other specialist officers, e.g., the tuberculosis and maternity and child welfare officers—as a stepping stone to that of medical officer of health.

The School Nurse—School nurses apart from their ordinary nursing qualifications are not called upon to produce any other. Several, however, are qualified to act as health visitors and a number of others also possess a special certificate in school hygiene which was established by the Royal Sanitary Institute some years ago, and for which special courses of training are obtainable in a number of institutions throughout the country.

THE RÔLE OF FIELD TRAINING

From what has been said it may be gathered that so far as Great Britain itself is concerned there is a very fair recognition of the needs in regard to the qualification of the various individual members of the health personnel. In addition it may be claimed that in general in the universities and elsewhere—schools of technology, for example—there is available an adequate amount of teaching and training for all grades. In all the courses of training it is noticeable that field work and practical experience occupy a considerable space. The chief reason for this is that there is insistence upon it in the syllabus of the examining bodies.

In the case of the person sitting for the degree or diploma in public health and the candidate for the certificate of the sanitary inspector, both must see actual work for a fairly long period in a public health de-

partment. The health visitor pupil also must work in a maternity and child welfare center during the whole of the time she is studying for her examination, i.e., a minimum period of 6 months. While there may be some who doubt the necessity and advantage of working in one department as an alternative to seeing methods adopted in a number of areas and institutions, it is noticeable that the Minister of Health in stating his requirements in the case of such officers as those to be engaged in venereal diseases and maternity and child welfare work, makes it a condition that they shall have had actual experience in a center.

Long as it is, this report does not pretend to be much more than a sketch of conditions as they exist in Great Britain in regard to the qualifications and training of health personnel. Those who desire further information may find the following orders, regulations, etc., useful: Details with regard to the training and examinations for degrees and diplomas in public health may be obtained from the London School of Hygiene and Tropical Medicine, Keppel Street, Gower Street, London, W. C. 1, England; and for the certificates of sanitary inspectors, meat and food inspectors, and health visitors, from the Secretary of the Royal Sanitary Institute, 90, Buckingham Palace Road, S. W. 1, London, England.

General Medical Council Resolutions and Rules for Diplomas and Degrees in Public Health, to come into force on October 1, 1931, is published by and may be obtained from Messrs. Spottiswoode, Ballantyne & Co., Ltd., London, England.

The following are obtainable from H. M. Stationery Office, Kingsway, London, W. C. 2, England:

Public Health (Officers) Act, 1921.

The Sanitary Officers Order, 1926.

Ministry of Health Memorandum 101/M. C. W. (Dealing with the training of health visitors).

Ministry of Health Circular 557 (Dealing with the training of health visitors).

Ministry of Health Circular 680 (Health Visitor's Certificate).

Ministry of Health Circular 879 (Appointment of Health Visitor).

The Local Government (Qualifications of Medical Officers and Health Visitors) Regulations, 1930.

Maternity and Infant Welfare Service in England and Wales*

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THE development of maternity and child welfare work has depended on two main factors—the desire to ameliorate individual suffering, and efforts to increase national efficiency. Both factors were stimulated by the Great War, which led to the discovery of large numbers of men whose low physical standard was found to be due in great measure to insufficient skilled attention in infancy and childhood; also the loss of large numbers of men created a national desire for an improvement in the rearing of children.

Four stages of development may be distinguished in England and Wales. From 1900 to 1914 there was a period of private effort and permissive legislation. From 1914 to 1918 was the period of encouragement of local effort by the government. From 1918 to 1930 there was a great development of State aid and control. Twelve months ago we entered upon a fourth stage following the introduction of the Local Government Act of 1929.

FIRST STAGE—1900 TO 1914

Before the earlier of these years, philanthropic agencies had been at work, and they received an impetus about 1900 from the awakening of public interest in the falling birth rate and the physical condition of the population as revealed by the experiences of the South African War. In 1904 a center where poor expectant mothers could receive free meals was established by voluntary enterprise in my own district of Kensington.

A series of conferences on infant mortality, organized by a voluntary committee in 1906, was opened; then several voluntary associations for promoting the health of mothers and infants were founded. The first infant consultation center was commenced in 1907 in the Borough of St. Marylebone; and the first school for mothers, from which infant welfare centers have sprung, was founded in 1907 in another London Borough, St. Pancras.

* Read before a Special Session of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 15, 1931.

The medical inspection of school children was made obligatory in 1907; and in the same year an Act was passed empowering local authorities to require all births to be notified to the Medical Officers of Health within 36 hours.

Beginning in 1908, the government made annual grants to local education authorities in respect of schools for mothers. Thus it will be seen that in the earliest days the government regarded this work primarily from an educational standpoint.

SECOND STAGE—1914 TO 1918

The government issued a circular in 1914 laying down conditions under which they would pay grants in aid of maternity and child welfare work carried out by local health authorities and voluntary associations. The first of these was paid in the same year, and from that time onward the government has accepted responsibility for 50 per cent of the cost of all approved schemes, the remainder being provided by local authorities and voluntary associations.

The Notification of Births Act of 1907, which was permissive, was made compulsory throughout the country in 1915.

THIRD STAGE—1918 TO 1930

In 1918 the Maternity and Child Welfare Act was passed. It gave wide and comprehensive powers to local authorities, acting with the approval of the government, to establish services designed to safeguard maternity and to preserve the health of children under 5 years of age, after which they enter school and come within the jurisdiction of the school medical service.

The grant paid by the Government rose from £56,809 in 1915 to £770,000 in 1920 and £1,193,707 in 1930. Of this last sum, the amount paid to local authorities was £929,824, and to voluntary bodies, £263,883. The total expenditure of the Government and local authorities in 1930 was £3,050,638; in addition, considerable sums obtained from charitable sources were spent by voluntary associations.

In 1919 there were in England and Wales 1,550 infant welfare centers, of which 660 were conducted by voluntary agencies. In 1930 the number had grown to 2,893, of which 913 were conducted by voluntary bodies. The provision of antenatal clinics was not started until after the war, but by 1930 these had been established at 971 of the infant welfare centers; there were also 75 special antenatal clinics, while others had been established at hospitals.

In 1930 dental treatment was provided at, or in connection with, 1,061 of the infant welfare centers. The equivalent of approximately 2,083 women were devoting the whole of their time to health visiting. Over 16,000 registered midwives had given notice of their intention to practise in England and Wales. Of the 660,267 births in 1928, over 65 per cent were attended by these qualified women. Local authorities have provided, or are paying for, 2,561 maternity beds in 158 institutions for difficult confinements or for women who cannot with safety be confined in their own homes. They have also provided or are paying for 1,068 beds in children's homes, 518 beds in baby hospitals, 131 cots in observation wards, and 900 beds for children in convalescent homes. Under schemes approved by the government there are 97 day nurseries which undertake the care and supervision of children under 5 years of age; there are 94 homes for unmarried mothers and their babies and these have accommodation for 1,410 women, who are received before confinement and subsequently retained, with their children, for a period averaging 6 months.

Two hundred and forty-three local authorities have made arrangements for home nursing of cases of measles, whooping cough, gastro-enteritis, poliomyelitis, ophthalmia and maternal complications, and 217 have provided treatment for crippling defects in children. Artificial light treatment has been established at 158 centers. In 1929 the expenditure on additional nourishment for expectant and nursing mothers and their children was £247,052.

Since 1927, private maternity homes run for profit cannot remain open unless registered by the local authorities, who have power to inspect these institutions, of which there are over 3,000.

FOURTH STAGE—1930 ONWARD

This Act, which is one of the greatest measures of reform in recent years, abolished poor law authorities, with the result that municipal and poor law services for maternity and child welfare will eventually be amalgamated and placed under the control of one local authority. The government grants of 50 per cent of approved expenditure were abolished and replaced by fixed block grants. Moreover, an important change was made in the system of determining the amount of grant to be paid to each authority. While a grant of 50 per cent of approved expenditure had been found to stimulate wealthy authorities to action, it did not in all cases prove sufficient to encourage the poorer authorities to establish adequate services. To meet this difficulty, a differentiation has been made and the new block grants are calculated upon a formula giving greater help to the poorer authorities.

All maternity and child welfare grants are now paid direct to local authorities, who in turn are required to give appropriate sums to the approved voluntary bodies operating in their respective areas; and the supervision of the work of these voluntary agencies has been transferred from the government to the local authorities.

The Act secures that the supervision of children's health from birth to school-leaving age is entrusted to one and the same authority and makes it possible for that authority to supervise midwives working in their area. Finally, it requires that medical officers and health visitors must have specialized experience before they can engage in maternity and child welfare work.

ADMINISTRATION

The administration of maternity and child welfare schemes is carried out by a special statutory committee of the local health authority. The authority may co-opt for service on the committee persons specially qualified by training or experience in subjects relating to health and welfare; but not less than two-thirds of the committee must have been directly elected as councillors on the authority, and at least 2 members of the committee must be women.

There are still many infant welfare centers, day nurseries, baby hospitals, etc., which are conducted by voluntary associations; these bodies appoint their own committees of management and are free to carry out their own administration, provided that, if they receive government grant, they conform to the rules laid down by the local authority and submit to inspection by officers of the authority.

There is much diversity of opinion as to the management and staffing of the various institutions, but it is almost the invariable rule that the entire work in an area is under the supervision of the Medical Officer of Health, who is in administrative control of the whole-time or part-time maternity and child welfare officers carrying out the work.

The majority of the assistant medical officers are women. In those districts where general medical practitioners are appointed to give part-time service, opinion is divided as to whether it is preferable to select doctors who are in practice in the area in which the institution is situated or those whose private work is some distance away; but there is a growing tendency to appoint whole-time assistant medical officers in those areas where the amount of work is sufficient to give full-time occupation to one or more officers. In smaller areas it is usual for one assistant medical officer to undertake the work at the infant welfare institutions and also to act as school medical officer, and perhaps even as tuberculosis officer. Where practicable, it is now

the common practice of local authorities to appoint whole-time health visitors (who are generally hospital-trained nurses with special public health experience) to carry out home visiting and to act as superintendents of the various institutions.

While there has been a gradual growth in the number of voluntary associations, the increasing difficulty experienced in recent years by these agencies in securing funds from private sources has made it necessary for some to be absorbed into the municipal organization; and in other cases the local authorities have had to supplement very considerably the government grant. It seems inevitable that voluntary maternity and child welfare bodies will become more and more dependent upon local authorities for financial support. The decline in voluntary financial support follows the growth of public opinion that the work initiated by private enterprise and voluntary endeavor has been proved to be of such great value that it should be maintained entirely by the State taxes and the local rates.

Although it is inevitable that local authorities must gradually assume more control and accept greater responsibility in regard to voluntary associations, it is desirable that every effort should be made to retain the interest and valuable help of the large number of ladies who devote their time and money to the development of the work: they radiate an excellent influence which the service cannot afford to lose.

It is equally important to secure the sympathy of the medical profession and the midwives. This support was not forthcoming from all quarters in the earlier years, mainly because some enthusiastic promoters of voluntary infant welfare centers tried to convert them into miniature hospitals and endeavored to divert sick mothers and children from general medical practitioners and hospitals by means of solicitation through home visitors and by generous gifts of milk.

The legitimate sphere of infant welfare centers is educative, preventive, and advisory. This idea has now been generally accepted and acted upon by those in charge, and the good will of the medical profession and midwives is being secured.

THE CAUSES AND INCIDENCE OF INFANT MORTALITY

The principal causes of death in the first month of life are difficult labor, complications of confinement, birth injuries, maternal toxemia, syphilis, and premature birth. The two most important causes of death after the first month of life are respiratory diseases and gastroenteritis.

Of the deaths of children under 1 year, 40 to 45 per cent are due to difficult labor, injury at birth, prematurity, and developmental dis-

eases, while approximately 25 per cent are due to respiratory diseases (including whooping cough and measles), 10 to 15 per cent to gastroenteritis, and approximately 20 per cent to other causes.

A certain number of infant deaths are due to prenatal biological causes over which the maternity and child welfare service can exert no influence. For reasons not yet known, some pregnancies end in the birth of monstrosities, others terminate prematurely; in some pregnancies pathological changes occur which are sufficient to render the child incapable of survival. It has been found that there is a non-preventable infant mortality of 25 to 30 per 1,000 births, and these deaths occur almost entirely in the first month after birth.

But there is a wide sphere for maternity and child welfare work in eliminating adverse environmental factors which cause infant deaths. These arise before birth, at, and after birth, and include ignorance of the mother, malnutrition of the mother, defective sanitation, lack of skilled attendance, poverty, bad housing conditions, overcrowding, industrial employment of the mother, lack of breast-feeding, and atmospheric impurity due to smoke.

In England and Wales the infant mortality is higher in urban than in rural areas; it is much higher among illegitimate children; it varies, broadly speaking, with the density of the population; and it is higher among the industrial than among the other classes. Table I shows that the incidence falls chiefly on the first 3 months of life, especially the first 4 weeks.

The infant mortality rate remained practically stationary for many years before the present century, but during the last 30 years the decline has been considerable and continuous, as is shown in Table II.

TABLE I
DEATHS OF CHILDREN UNDER 1 YEAR PER 1,000 BIRTHS IN ENGLAND AND WALES

<i>Year</i>	<i>Under 4 weeks</i>	<i>4 weeks to 3 months</i>	<i>Total under 3 months</i>	<i>3 to 6 months</i>	<i>6 to 12 months</i>	<i>Total under 1 year</i>
1896-1900	—	—	74	34	48	156
1901-1905	—	—	70	28	40	138
1906-1910	40	23	63	22	32	117
1911-1915	39	20	59	20	31	110
1916-1920	37	17	54	14	22	90
1921	35	15	50	14	19	83
1922	34	13	47	11	19	77
1923	32	11	43	10	16	69
1924	33	12	45	11	19	75
1925	32	13	45	11	19	75
1926	32	12	44	10	16	70
1927	32	11	43	10	17	70
1928	31	11	42	9	14	65

TABLE II

MORTALITY RATE UNDER 1 YEAR PER 1,000 BIRTHS IN ENGLAND AND WALES

1896-1900.....	156
1901-1905.....	138
1906-1910.....	117
1911-1915.....	109
1916-1920.....	90
1921-1925.....	76
1926.....	70
1927.....	69
1928.....	65
1929.....	74
1930.....	60

In an impartial review of the situation, due regard must be paid to the contributory factors which have been at work side by side with the maternity and child welfare service. During and after the Great War the economic conditions of the working classes have been greatly improved, and in the post-war period there has been an increased and successful attack upon the "racial poisons"—alcohol, syphilis, and tubercle. The improvement in the midwifery service following the introduction of the Midwives Act of 1902 has been considerable. It is during the growth of the maternity and child welfare service that the community generally has enjoyed the benefits of the school medical service, established in 1907, and of National Health Insurance, inaugurated in 1912—the latter including maternity benefits for the insured.

The great sanitary improvement which has taken place in England and Wales had begun many years before maternity and child welfare services started; but in this connection it is fair to point out that although this factor had affected the general death rate in the latter half of the last century, it has only been during the period in which the maternity and child welfare work has been growing that the infant death rate has been falling.

Statistical data are open to widely different inferences and interpretations, but a careful survey has led to the general opinion that a considerable portion of the diminution in infant mortality can be ascribed to maternity and child welfare work of local authorities and the voluntary associations working in coöperation with them. Medical opinion supports this view entirely, but it is clearly impossible to determine the extent to which the credit for the diminution should be attributed to the various factors which have been operating.

A further reduction in the infant mortality rate can be made by securing additional improvements in the general sanitary environment, particularly in housing; by extending and improving the present ma-

ternity and child welfare schemes with a view to securing better education of mothers in the care and management of their children; by the provision of a domiciliary nursing service; by establishing improved coördination of the work of local authorities with that of private medical practitioners, midwives and general hospitals so as to secure effective prenatal supervision, adequate attendance at childbirth and such assistance as may be required to protect and safeguard the health of mothers and children after birth. Finally, and most important of all, much further improvement can be secured by the education of the community in all matters of public and personal hygiene. In this connection it should be pointed out that medical officers of health are anxious that maternity and child welfare work should not be divorced from other practical preventive work carried out under their supervision. They regard general preventive medicine as a developing service, of which maternity and child welfare work is a developing part.

MATERNAL MORTALITY

There are about 600,000 mothers in England and Wales giving birth to children each year. Of these, about 3,000 have died in each of the last 10 years in the fulfilment of this function. This is a serious and largely avoidable loss of life at the time of its highest capacity and in its most fruitful effort. Moreover, the deaths do not indicate the whole loss, for a much greater number than 3,000 are each year permanently injured or invalided in the physiological process of childbirth.

During the present century the general death rate for all persons at all ages has been reduced by approximately one-third, the infant mortality rate has been halved, and the death rate of women at reproductive ages from all causes has declined; but, as is shown in Table III, the maternal mortality rate has shown but little decrease in the last 20 years:

Puerperal sepsis accounts for the highest number of deaths; toxemia of pregnancy comes next; then hemorrhage; lastly, the various forms of disease concurrent with pregnancy or confinement may, either of themselves or by rendering confinement difficult, have fatal issues, among them being heart disease, pneumonia, rickets, syphilis and embolism.

The enormous interest aroused in this problem in recent years resulted in the government setting up a Maternal Mortality Committee, who have recently issued an important document incorporating the experience of a number of obstetricians and the results of a detailed study of 2,000 deaths of mothers in childbirth. The committee found that

TABLE III

Year	Births Registered	Deaths of Women Classed to Pregnancy and Childbearing			
		No. of Deaths	Rates per 1,000 Births Registered		
			Puerperal Sepsis	Other Causes	Total Mortality
					3.87
1911	881,138	3,413	1.43	2.44	3.98
1912	872,737	3,473	1.39	2.59	3.96
1913	881,890	3,492	1.26	2.70	4.17
1914	879,096	3,667	1.55	2.62	4.18
1915	814,614	3,408	1.47	2.71	4.12
1916	785,520	3,239	1.38	2.74	3.89
1917	668,346	2,598	1.31	2.58	3.79
1918	662,661	2,509	1.28	2.51	4.37
1919	692,438	3,028	1.67	2.70	4.33
1920	957,782	4,144	1.81	2.52	3.91
1921	848,814	3,322	1.38	2.53	3.81
1922	780,124	2,971	1.38	2.43	3.81
1923	758,131	2,892	1.30	2.51	3.90
1924	729,933	2,847	1.39	2.51	4.08
1925	710,582	2,900	1.56	2.52	4.12
1926	694,563	2,860	1.60	2.52	4.11
1927	654,172	2,690	1.57	2.54	4.42
1928	660,267	2,920	1.79	2.63	4.33
1929	643,673	2,787	1.80	2.53	

in 48 per cent of these there was an avoidable cause—an absence of antenatal care in 17 per cent, errors of judgment in practice or treatment by doctor or midwife in 17 per cent, negligence of the patient or her friends to adopt or carry out medical advice in 9 per cent, and lack of reasonable facilities for effective medical care in 5 per cent. In the remaining 52 per cent of deaths no preventable factor actually emerged, but the committee expressed the opinion that a fuller knowledge of the facts would probably have revealed such a factor in many, and that not less than half of these 2,000 deaths were avoidable.

HOW THE MATERNAL DEATH RATE MAY BE REDUCED

A study of the report of the Maternal Mortality Committee shows that, in order to secure a reduction of this high rate in England and Wales, there is a need for improvement in the education of the medical student in the principles and practice of obstetrics and gynecology. There is also room for improvement in the quality of medical practice. It is appreciated that doctors often work under a serious handicap in obstetric cases, but the investigation has shown the need for a higher standard of knowledge and skill on the part of medical practitioners, as well as for the provision of consultant services and of an increased

number of beds in maternity hospitals. Local authorities should improve and extend the facilities available at antenatal clinics. Every pregnant woman should have the advantage of effective antenatal supervision and a more intense effort must be made to educate and encourage mothers to use the facilities provided.

The committee recognized the immense progress made in recent years; but stated that there is still scope for further coördination of the maternity and child welfare services in every area, and formulated proposals for a national maternity service which may be summed up as follows:

1. The provision in every case of the services of a qualified midwife to act either as midwife or as maternity nurse.
2. The provision of a doctor to carry out antenatal and postnatal examination in every case, and to attend during pregnancy, labor and the puerperium, as may prove necessary, all cases showing any abnormality.
3. The provision of a consultant, when desired by the doctor in attendance, during pregnancy, labor and the puerperium.
4. The provision of hospital beds for such cases as need institutional care.
5. The provision of certain ancillary services, e.g., transport, sterilized equipment, laboratory facilities.

While the committee's report contains little which is original, it has brought together for the first time the various aspects of the problem. It has shown the channels along which future efforts should be directed. Briefly they are—improved antenatal supervision, improved obstetric practice, and more complete local organization to provide and make available all the necessary facilities for an effective service.

Evaluating the True Significance of Venereal Disease Morbidity

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THERE is no doubt whatever that efforts made by different countries of the world in combating venereal diseases have given good results, and we must believe what statistics show us in order to be satisfied. Notwithstanding this statement, a careful analysis of the morbidity coefficient obtained by reference to total population makes us believe that the decrease is more apparent than real.

The venereal disease morbidity coefficient for a determined period of time is calculated on the basis of the total census population or on that evaluated yearly by means of special equations. Let us suppose, for example, that during the year 1920 in "X," with a population of 5 million, 35,000 first infections of venereal diseases were registered—this would give us a 7 per cent morbidity for that year. The census of 1930 shows that the population of this same land has increased to 6 million, but the number of venereal disease contagions registered was more or less the same; nevertheless the morbidity would be 5.8 per cent.

We estimate that the error induced is larger if we take into consideration that the population which has raised the number from 5 to 6 millions is under puberty, and owing to this physiological reason, not exposed to a venereal contagion.

If we next think on the decrease of infant mortality, we will arrive at the conclusion that the estimation of venereal disease morbidity through simple calculation referred to total population does not give us a true knowledge of the real state of affairs.

On the other hand, we believe that there exists another factor which has contributed in a considerable degree to lower the number of venereal disease first contagions—the perfected methods of statistics which every day lessen the possibilities of reinscription and thus computation of a case two or more times.

With the system of identification card we keep in our dispensaries (24 in Chile), we are able frequently to prove that one man has abandoned one of them and sought treatment in another. With this

method such a patient will never be inscribed in our index as a new case of syphilis. Without this card one syphilitic appeared before as a primary case several times, and increased the statistics.

According to our opinion, the most accurate data for evaluating the efficiency of methods adopted toward preventing venereal disease contagion will be obtained when we modify our statistical methods in the way that we will try to prove.

In the vital statistics (demography) we find the most interesting data to establish our method. Starting from the total number of births in a given year, we can follow this mass of new-born through years until we arrive at the age at which we wish to start our study. For example, we start in the year X, in which 10,000 children were born. Of this total 8,000 reached their 15th year in the year Z. In the year X-1 12,000 children were born, of which only 9,000 reached in the year Z-1 their 15th birthday. If we then search the number of venereal disease contagions registered among boys of 15 years during Z and Z-1 years, we will be able to make a sound comparison (see illustrative table).

These groups can easily be followed yearly through statistics and we can keep a record of each successive annual group as regards ve-

Table for age 15 years

Year	Born	Death rate per year															Alive	Venereal Contagions	% in relation to living
		0-1	1-2	2-3	3-4	4-5	5-6	6-7	7-8	8-9	9-10	10-11	11-12	12-13	13-14	14-15			
1910	10000	600																	
1911	9000	720	350																
1912	12000	636	405	210															
1913			415	202	100														
1914				106	112	72													
1915					121	66	62												
1916						68	52	42											
1917							47	39	31										
1918								36	32	18									
1919									24	17	12								
1920										10	16	8							
1921											12	10	5						
1922												6	4	4					
1923													2	3	2				
1924														1	3	2	8484	325	38.3
1925															2	2	7317	285	38.9
1926																1	10123	425	40.

venereal disease contagion. If we allow 5 per cent error, which I esteem excessive, for emigration or immigration, I think we will always benefit largely by thinking of the advantages of basing our statistics on this method.

On the other hand, we can also group the total number of venereal infections in sections of 15-19 years, 20-24 years, etc., and make a series of combinations that will allow us to draw numerous interesting conclusions. Sex identification in all these series will afford us an inestimable means of relating these data to social development of communities, and of pointing out the most important sources of sensuality and exposure to contagion.

Clinics of Mental Hygiene, Milan

A RECENT decree issued by the government of the province of Milan provides for the establishment of 4 mental hygiene clinics in the city of Milan and 4 in other cities of that province. Additional clinics are to be opened as needed.

Their purposes will be: early diagnosis of mental disease; prevention of such disease through welfare work with persons showing abnormal tendencies; dispensary treatment combined with home visiting by a nurse; and financial aid and aid in kind when necessary. The clinics will be attached to the psychiatric hospital of Milan and maintained from public funds. Each clinic will employ a visiting nurse. The physicians at the clinic are required to instruct the patients in mental hygiene. The clinics are required to coöperate with the child welfare organizations and the various agencies interested in the protection of the people's health.—*La Medicina del Lavoro*, Milan, 1931, No. 8, p. 336.

Food Poisoning Following the Eating of Codfish Cakes

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A GREAT variety of food products has been found to be associated with so-called food poisoning. In previous years, canned meats and vegetables, olives, cheese, and ice cream were the most common vehicles of transmission, and organisms of the salmonella, paratyphoid, enteritidis, and botulinus groups were most frequently isolated. More recently cake,¹ eggs,² cream fillings, and custard fillings have been identified with outbreaks of food poisoning.

Several years ago we learned of a case of gastroenteritis in which symptoms developed shortly after the eating of cake containing a cream filling. A piece of the cake regarded as the cause of the illness was examined bacteriologically and large numbers of *Staphylococcus aureus* were obtained. An investigation developed the fact that the baker who had prepared the cake suffered from boils of the forearms. That sickness may be induced by the eating of food contaminated by staphylococci is indicated by the studies of E. O. Jordan,³ who found that broth cultures of *Staphylococcus aureus* when taken by mouth produced gastrointestinal disturbance.

To the list of food products now occasionally identified with symptoms of poisoning we wish to add another—fish-cakes—the eating of which by several individuals resulted in illness with marked gastrointestinal symptoms.

On a warm Friday in June there was placed on an open counter in a public market a tray holding several dozen codfish cakes. Purchases were made by several women in the morning and eaten at noon. In each family which ate of them gastrointestinal symptoms developed and in 2 the symptoms were identical and severe. The history of one is as follows:

Codfish cakes bought at 11:30 A.M. were eaten at noon by the mother and 3 sons. At 8 P.M. the mother developed fever, abdominal cramps, vomiting, diarrhea, and was prostrated. The 3 boys also became sick that night with identical symptoms. The father of the

family did not eat the fish-cakes and remained well. The mother and sons were ill for about a week, but recovered.

A piece of codfish cake was obtained on the following day by the attending physician, and brought to the laboratory in waxed paper which was part of the original wrapper. We found in smears of the fish-cake numerous Gram-positive cocci and Gram-negative bacilli. Cultures on blood-agar plates yielded many colonies of streptococci of the viridans type, and a Gram-negative bacillus, which exhibited the following characteristics:

A slender non-motile bacillus producing on Endo's medium colorless colonies about 1 mm. in diameter with granular surfaces. Veining and slightly scalloped margins were present. On triple sugar medium, the butt showed acid production; the slant remained colorless, and there was no gas production. Litmus milk became faintly acid; gas was not formed in lactose broth, nor in the various carbohydrate media. In dextrose, maltose, mannite, levulose and galactose, acid was formed but none in saccharose or dextrin, and only in lactose on prolonged incubation. Indol failed to develop in peptone broth.

The organism was not agglutinated by typhoid serum or by dysentery serum, Shiga. Indefinite agglutination was obtained with polyvalent serum. A guinea pig injected intraperitoneally and a rabbit intravenously with a 48-hour broth culture both developed frequent bowel movements and loss of appetite but soon returned to normal.

The organism seemed to be an atypical strain of *B. dysenteriae* and a culture was submitted to Marion B. Coleman of the Division of Laboratories, Department of Health, State of New York, who reported the organism to be *B. dysenteriae* Sonne.

The circumstances in this small outbreak of food poisoning make it appear very probable that the codfish cakes were responsible for the symptoms. The *B. dysenteriae* is not commonly associated with food poisoning although Gilbert and Coleman⁴ found it rather frequently in specimens of feces obtained in New York State, and suggest that this strain of *B. dysenteriae* may be more prevalent than has been supposed. Since the organism develops a soluble exotoxin which is readily absorbed by the intestine it is not unlikely that many common foods may become contaminated by this strain of *B. dysenteriae* and when eaten give rise to symptoms of food poisoning.

REFERENCES

1. Laidlaw, F. W. *Health News*, New York State Dept. of Health, VII, 49: 193, 1930.
2. Scott, W. M. Food Poisoning Due to Eres, *Frit. M. J.*, 3627: 34, 1930.
3. Jordan, E. O. The Production by *Staphylococci* of a Substance Causing Food Poisoning, *J. A. M. A.*, 94, 21: 1648, 1930.
4. Gilbert, R., and Coleman, M. B. Case of Dysentery in New York State Attributed to *B. dysenteriae* Sonne, *A. J. P. H.*, XIX, 3: 312 (Mar.), 1929.

Work Environment as a Factor in the General Health of Workers*

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IN discussing the influence of work environment on the health of industrial workers, we are concerned primarily with the predisposing causes of disease; not with the exciting causes. Adverse work environment, including bad housing, is not, of course, a disease in itself. One cannot subject it to microscopic examination and isolate a pathogenic bacillus to which a name may be given. It cannot be subjected to laboratory analysis to determine its chemical constituency, nor can one so label it in the nomenclature of causes of death that the physician may incorporate it on his death certificate. Nevertheless, this does not minimize the importance of the problem since the predisposing causes of which it is one are often as great a menace as the organisms of disease, or the industrial poisons that destroy cell life and inhibit the normal functioning of the body organs.

To the industrial hygienist this may seem trite. Gifted with an inquisitive mind, he seeks and finds causes for industrial diseases not only in the chemical and physical properties of the elements and compounds handled in industrial processes but also in the faulty hygiene of the worker and of the workplace. That he can reduce the frequency and severity of industrial diseases through improved plant practices demonstrates that often the serious aspects of such operations are not the materials themselves so much as the way they are handled. Some processes are always potential hazards, but by means of plant or personal hygiene the danger from them may be reduced or eliminated.

If the hygienist limited his research to the demonstration of a specific compound as the exciting cause of an industrial disease, very little progress in the maintenance of industrial health would be made. Because health research in industry recognizes the part played by working conditions and the work habits of the industrial worker, and institutes plant improvement programs directed against them, progress in industrial health has been rapid.

* Read before the Industrial Hygiene Section of the American Public Health Association at the Sixtieth Annual Meeting at Montreal, Canada, September 15, 1931.

Out of such recognition of working conditions as causal factors in industrial sickness have come definite programs to eliminate defects in plant sanitation, faulty illumination, excessive temperatures, insufficient or excessive humidity, excessive noise, monotonous or heavy labor responsible for excessive fatigue, overcrowding of work rooms, and faulty employment practices that create irritating human relationships and wrong mental attitudes among workers toward plant management.

Thus, from the known hazard attendant on the use in the plant of poisonous compounds, designated here as the exciting causes, and the known influence of adverse plant conditions, designated here as contributing causes, the hygienist is able to develop a preventive program which reduces the incidence of industrial diseases. The question here is, does he go far enough in determining all the factors that affect the health of the worker and so influence his efficiency as a producer?

The primary function of the hygienist, whether in research or counsel to the plant management, is to evaluate every major factor that has a bearing on the health of the worker or that increases his susceptibility to disease whether of a communicable, degenerative, or industrial nature. Only as his analysis is comprehensive can he state specifically the responsibility of any set of causes. This is not an academic judgment, since the comprehensiveness of his knowledge and the programs based upon it affect alike the practicality of the measures he recommends to the plant and the thoroughness of the protection he gives to the worker. Moreover, in so far as he tries to approach his problem as a scientist, he must include in his research every major field influencing the health of the workers. The line of demarcation of his analysis cannot scientifically be the plant boundary; it must necessarily be advanced beyond this to include the home environment of the worker and the factors there which have a tendency to lower body resistance or increase susceptibility to any disease.

This is conspicuously exemplified in the study of fatigue. The predisposing causes recognized by the hygienist as being associated with certain plant processes or conditions which induce excessive fatigue are not always of plant origin. Indeed, much of the so-called "industrial fatigue" does not arise within the plant, though often so credited, but is a compound of plant activities and home or other environmental conditions which deny to the worker adequate rest. Thus, overcrowded neighborhoods, congested sleeping quarters, poor ventilation with excessive temperatures, all tend to prevent normal rest and deny the recuperation which should follow a day's toil. There is thus produced a cumulative effect from industrial fatigue and disturbed rest which leaves the worker more susceptible to adverse working conditions and processes.

Other non-hygienic home conditions produce results similar to those associated with adverse plant conditions. Moreover, the de-energizing effect of depressive environment has many physical and mental complications which cannot be overlooked. Needless to say, any program for the maintenance of industrial health which concentrates on environment within the plant, and disregards the homes of workers outside, renders the employer a restricted and oftentimes misleading service. It cannot but dub the hygienist as a pseudo-scientist.

To anyone with only a casual knowledge of the housing field these comments may seem unwarranted strictures. It may be alleged that the industrial worker's home is the same type as the average home of the community, and thus its defects should be the concern of the public health department. It may be claimed that lack of a pure water supply, of sanitary equipment or of sanitary sewage and waste disposal, overcrowding, abnormal or subnormal temperatures in certain types of homes, caches of filth and vermin, are the community's obligation, with industry absolved from all responsibility except as its managers are citizens. The industrial hygienist may likewise believe his responsibility is only social and not professional—although his greater knowledge of the consequences of unsanitary conditions should make this interest somewhat keener—and that his sphere of research is restricted to the determination of plant health hazards.

To one who has specialized in both housing and industrial hygiene this attitude seems grossly unscientific. The scientific mind is the searching mind. It is looking for causes. It does not limit its field of research, if by so doing it stays its search short of knowing all the factors that may affect the results. This does not mean that in research into lead poisoning one must initiate a housing program. It does mean that if we ignore the influences of the homes we may mistakenly conclude that certain processes are non-hazardous because we may have a large percentage of employees who live under conditions that help to maintain their physical condition and are therefore less susceptible to special hazards.

The reverse may be true. There is a tendency to blame the plant when the substandard home is equally at fault. The high incidence of special diseases in some industrial plants may be due to the low physical resistance of the workers because they are exposed during non-working hours to slum living conditions. Personal hygiene and certain habits that we associate with predisposing causes are included in our schedules of physical examinations; plant conditions are considered, but living conditions have received only cursory attention. This seems absurd, but it is true. Consequently, the effect of the

work environment outside the plant is not emphasized and any interest displayed in the workers' living conditions is on an emotional basis rather than because the managers consider it good business to assist their employees to attain wholesome homes. Unfortunately, this is the least satisfactory basis for sustained, constructive interest. Yet today in the United States the health hazards to industrial workers which arise from home environment constitute a major problem. The worker is heavily handicapped, his earning capacity reduced, and the employer unnecessarily burdened with added production costs. There is a trend in our cities toward decentralization, in part induced by tax burdens but largely because the labor supply is substandard. Factories are moving to the country where they can find relief from these cost-increasing factors. Any brief survey of urban conditions is sufficient to demonstrate the prevalence of substandard housing in areas where wage earners live.

The characteristic defects of such areas are conspicuous: congested buildings, often of the multiple type of occupancy; room overcrowding; a high percentage of families occupying apartments of 1 and 2 rooms and often living in basements, cellars and back lot houses; insufficient natural light and substandard artificial light; excessive temperatures; inadequate sanitary equipment; insanitary drainage; widespread prevalence of filth both within and without the dwellings; unsafe structures; insufficient play space for children; street hazards; widespread nuisances in the form of defective plumbing, flooded cellars, and damp rooms; general drabness and deterioration of whole neighborhoods which exerts a depressing effect upon the population. Ten per cent of the workers of the country are exposed to some or all of these conditions, nor are they limited to large urban centers although they are more conspicuous there due to segregation. Even the smaller cities and villages have their areas of substandard dwellings and subnormal living.

It is not true, as some imagine, that the slums house only the day laborer. They provide quarters for the so-called skilled-trades workers as well. Throughout the country, these blighted areas are inducing an irregular manner of living; they are furnishing a large percentage of the causes for the spread of communicable diseases; are undermining public health; and in a measure are responsible for the accelerated fatality of the degenerative diseases.

The criticism of the existence of such areas cannot be refuted on the grounds that the inhabitants are content with their homes. There is no justification for inactivity in the belief that such persons, if given good housing, would continue in the manner of living from which they

had been removed. Even if this statement, which is false in 90 per cent of the cases, were true, it would be no answer to the problem presented by these individuals and their homes. Their threat to society alone would justify any amount of attention to housing betterment; but our interest is not in the general menace of existing conditions but rather in their specific handicap to efficient labor, because industry is frequently falsely accused of maintaining hazardous working conditions producing disease and ill-health, when actually the situation is complicated and accentuated by the insanitary state of the homes the workers occupy.

The statistical records prove that occupants of substandard houses and areas show abnormally high morbidity and mortality rates, high percentages of physically unfit workers, many lacking the right mental attitude or intelligence to accomplish the work assigned to them in the plant or to stabilize their employment by continuing their jobs under normal conditions. In times of slack employment, the workers with poor environmental conditions are the first to be laid off, but in times of normal business they must be employed because they constitute the only extra labor supply available. When employed, they contribute a high rate of absenteeism on account of sickness, and cause a costly labor turnover which affects production costs.

Because of the prevalence of adverse living conditions and their reaction upon the physical and mental health of workers, the industrial hygienist must, if he is to do scientific research, carry his studies beyond the plant boundaries, and furthermore if he is to advise the plant management wisely, he must emphasize the disadvantage of such adverse living conditions to industrial workers. Housing specialists do not characterize bad housing as an exciting cause of disease but they do emphatically believe that it is a predisposing cause, which is relatively as important in the final physical breakdown as many exciting causes more frequently emphasized.

The object of this analysis of the health of industrial workers is to assure due valuation of the contributing part played by environmental factors on the one hand, and on the other, to call the attention of plant managers to an aspect of their problem which has been generally neglected. Industry is not to be encouraged to finance housing schemes, but it should formulate a program which will assure the elimination of bad environmental conditions for employees.

Industry does not need to build towns or model dwellings for its workers in order to insure adequate standards of living. It can exert its influence on safe, wholesome living conditions by establishing and giving adequate publicity to an employment policy which gives pref-

erence to those workers who have shown, or will show, an intelligent self-interest in avoiding the occupancy of substandard dwellings or areas.

Where the supply of sanitary houses is adequate but the business judgment of the worker poor, industry can promote thrift associations such as building and loan societies to facilitate home ownership; where the supply within the buying or renting ability of its employees is insufficient, industry can, by means well within its sphere of interest, encourage builders to erect new houses, and urge owners to recondition those old houses which are within a reasonable distance from the plant. If the situation is chronic, as it is in large urban centers, plants can be moved to suburban areas or to smaller towns where more normal living conditions will be assured.

It is not our purpose here to outline and define industry's program for adequate housing of employees so much as to indicate that a reasonably selfish interest dictates a recognition of the part played in economic organization by insanitary housing. Good judgment necessitates the inclusion of housing data in analyses of the hazards of industry, and, in the event that a causal relationship is found between environmental conditions and the diseases they are studying, these findings should be emphasized so that plant managers will feel it incumbent upon them to develop a program adequate to meet the situation.

The Response to the Appeal for Blood for Treatment of Poliomyelitis

OVER 1,100 persons responded to the appeal of the State Department of Health for donors of human immune blood for use in the treatment of cases of poliomyelitis. Actually 1,011 persons were bled between July 27 and October 5, exclusive of the 31 patients at the Georgia Warm Springs Foundation who contributed their blood. In addition, 87 persons were bled twice and many other donors volunteered to be bled a second time. A long and growing list of later volunteers is held in reserve at the State Laboratory. Fifty of the 57 counties in the state outside of Greater New York are represented by at least one donor each. The record is interesting and gratifying from both the administrative and public health standpoints and also as a fine example of immediate state-wide response by individuals to an emergency health appeal.—*Health News*, New York State Dept. of Health, Oct. 26, 1931.

EDITORIAL SECTION

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THE CONGRESSIONAL AWARD TO THE YELLOW FEVER COMMISSION

THE award of medals by Congress to the Army Medical Commission, which cleared up the etiology of yellow fever—Dr. Walter Reed, Chairman, Dr. James Carroll, Dr. Jesse W. Lazear, and Dr. Aristides Agramonte—and to those who took part in the experimental work by offering themselves as subjects and otherwise, calls for more than passing comment.

This Commission was appointed in 1900. Agramonte and Lazear were already in Cuba, and Reed and Carroll joined them in Havana in June of that year. So rapid was their accomplishment that at the 29th annual meeting of the American Public Health Association held in Indianapolis, Reed was able to give a paper called "The Etiology of Yellow Fever—A Preliminary Note," and the *Philadelphia Medical Journal* gave an article on the same subject in its issue of October 27, 1900. On the night of December 31, with only a few minutes of the old year remaining, Reed wrote to his wife, "The prayer that has been mine for twenty years, that I might be permitted in some way or at some time to do something to alleviate human suffering, has been granted! A thousand Happy New Years." Other publications followed rapidly. On February 16, 1901, the *Journal of the American Medical Association* published the article read by Reed before the Pan-American Medical Congress in Havana during that month.



Such is in brief an outline of one of the most remarkable pieces of medical work which the century has seen—one which has saved tens of thousands of lives and tens of millions of dollars. Curiously enough, it excited little interest outside of medical circles. The U. S. Government, which profited vastly by the discovery, took practically no notice of it, and even our universities did scant honor to the men who had carried out this magnificent piece of research at the danger of their lives, one of them indeed having succumbed to the disease, and a second having been desperately ill of it during the work. In 1902, Harvard University conferred the honorary degree of Master of Arts on Reed, and the University of Michigan the degree of LL.D. As early as 1903 an association was formed with the object of calling attention to Reed's work and establishing a memorial. Its work finally took the form of an attempt to raise a fund of \$25,000, the income to go to Mrs. Reed and her daughter during their lives, the principal to be applied to the erection of a monument to Reed, or the promotion of research in his especial field. A number of articles were published urging such recognition, and individuals worked to the best of their ability, with little or no effect. The proverbial ingratitude of republics left the work of Reed and the Commission, as well as the devotion of the noble persons who lent themselves to the dangerous work without recompense, practically unnoticed officially. Finally some 30 years later, Congress voted the award of gold medals to the Commission and to 18 soldiers and others who had taken part in the work. These medals were sent during the first week of October, 1931, to the survivors and heirs, since, alas, many of the original workers had passed on. It may seem a bit ungracious at this time to call attention to the neglect of Reed, his medical coworkers, and others. It is true that all are now delighted at this recognition, late though it comes, and one is

inclined to be a bit cynical over the value of a medal to the families of the dead. On the other hand, we rejoice that our government has at last been awakened to the importance of scientific work, even though late. Had this work been done by an Englishman or Frenchman, for example, the awards would have been prompt and abundant. Jenner, the discoverer of vaccination, received grants amounting to £30,000, and an additional £7,383 from subscriptions in India. Lister was knighted and elevated to the peerage. Pasteur received from the French government a pension of 12,000 francs annually, and many other instances might be cited.

The last surviving member of the Commission, Aristides Agramonte, died in September of this year while in New Orleans preparing to assume his duties as Professor of Tropical Medicine. Lazear died of yellow fever during the work. Reed and Carroll have been dead for approximately 25 years. Some of those who lent themselves for experimental purposes have been in bad health and dire need. One cannot help thinking that it would have been much better to have given these men recognition in the shape of even small pensions than to send gold medals to those who have survived and to the heirs of those who are dead.

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THE HEALTH OF PORTO RICAN CHILDREN

THE sanitary problems of one section of the United States may be and generally are of direct significance to the people of all other parts of the country, no matter how distant. Although disease is sometimes influenced by geographical considerations, it is seldom hindered by political barriers, and practically never by social or economic boundaries. National health is more difficult to visualize than

is community hygiene, but it is just as important to every citizen of the nation.

Porto Rico and its distressing health conditions may seem remote to most of us; but this West Indian island has been part of the United States for a third of a century, and its million and a half inhabitants are as much American citizens as the Mayflower descendants of Massachusetts, or the cosmopolitan residents of East St. Louis. A committee of the American Child Health Association¹ has pointed out that ignorance and poverty, and their inevitable concomitants, sickness, disease, and undernourishment, are excessively prevalent on this attractive tropical island. The crude death rate in Porto Rico is nearly double that in the United States, and infant mortality, that sensitive index of sanitary progress, is almost 3 times as high.

According to our standards of age distribution, Porto Rico has about 175,000 children too many. Despite unfavorable economic conditions, the birth rate is estimated to be over 40 per 1,000, and the census of 1920 recorded the amazing fact that 43.3 per cent of the population was under 14 years of age. Contrast this with 31.7 per cent in the United States, according to the figures of the same census. Tuberculosis, hookworm, malaria, and malnutrition are, next to the abnormal infant mortality, the most serious of the health problems of Porto Rico. Tuberculosis is literally epidemic, with a death rate over 300 per 100,000 population, while malaria and hookworm are endemic. Although the first scientific research which led to the recognition of the American necator was done more than 30 years ago in Porto Rico by Captain Bailey K. Ashford of the U. S. Army Medical Corps,² hookworm has never been extirpated from Porto Rico and, according to the investigators, will not be until the inauguration of full-time health service for the entire island.

Malnutrition is ubiquitous in Porto Rico. Sherman³ states that provision of milk for the children of the island may well take rank as a public health measure along with the hospitalization of open cases of tuberculosis, the field work against hookworm and malaria, and the laboratory studies of intestinal diseases. Since the milk supply is inadequate, the solution of this urgent problem lies in the liberal use of American canned milks. Already, many of the official child welfare stations are supplied with powdered whole milk and where this has been employed, gratifying reductions in infant mortality and improvement in child health have been obtained.

Because of an abundance of sunlight, rickets is rare, although calcium intake is low. Sherman believes that the low calcium and low vitamin A content in the diets of these children probably tends to make

them less resistant to tuberculosis. Anthropometric measurements by Mitchell¹ indicate, moreover, that diet and disease have definitely influenced the stature of Porto Rican children.

Although children of the better socio-economic classes were found to have larger skeletal frame and musculature and greater amounts of subcutaneous tissue than the less privileged groups, dental caries was more abundant in the former class than in the latter. The tendency to dental caries among Porto Rican children operates, in fact, in a reverse manner from what would be expected and as has been the experience in the United States. This strange finding seems inexplicable and the only attempt to explain it is that there is some obscure influence favoring immunity to dental caries which only further study can reveal.

This notable report on child health in Porto Rico contains much that is provocative in the realm of medical science. Not only is it a noteworthy contribution to modern public health, but it raises sociological, economic, and even governmental questions of vast importance. Should one section of the United States be permitted to suffer continuous ill-health when others are favored with skillful attention which serves to reduce death rates and render life longer and more enjoyable? Physical and mental health is conceded to be one of our greatest national assets. Desirable improvement in physical vitality should be the privilege of every American citizen and particularly of those who are to be the citizens of the future.

REFERENCES

1. Crumbine, S. J., Mitchell, H. H., and Tapping, A. M. *Porto Rico—An Inquiry as to the Health of the Children*. Am. Child Health Assn., 1931.
2. Tobey, J. A. *Riders of the Plagues*, 1930.
3. Sherman, H. C. Some Aspects of the Chemistry of Nutrition in Relation to Health. *Porto Rico, J. Public Health & Trop. Med.*, V: 407 (June), 1930.

ASSOCIATION NEWS

NEW MEMBERS

The following list includes applicants who have been approved for membership in the A. P. H. A. by the Sub-committee on Eligibility. These new members have requested affiliation with the sections indicated, and action by the Section Council will follow.

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Drew R. Handley, M.D., Edinburg, Tex., County Health Officer
Dr. J. A. Milne, Jackson, Miss., Director of Field Unit, State Board of Health
John W. Shisler, M.D., Miami, Fla., Director of Public Welfare

Vital Statistics Section

- Edward P. Hutchinson, Boston, Mass., Instructor, Vital Statistics, Harvard School of Public Health

Public Health Engineering Section

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James K. Fulson, Cleveland, Miss., Sanitary Inspector
John E. Waaser, Jr., East Mauch Chunk, Pa., Public Health Engineer

Industrial Hygiene Section

- Lillian Martin, Sussex, N. J. (Assoc.)

Food and Nutrition Section

- Colton R. Clark, Atlanta, Ga., State Chemist, Dept. of Agriculture
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Director, Nutrition Service, Evaporated Milk Assn

Harold T. Pratt, Philadelphia, Pa., Charge of Sanitation, Phila. Dairy Products Co

Child Hygiene Section

- John J. Kelly, M.D., Marlboro, Mass., School Physician
Raymond Wing, M.D., Blairstown, N. J., School Physician

Public Health Education Section

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D. Clare Gates, Ann Arbor, Mich. (Assoc.)
Maurice S. Goodman, Ann Arbor, Mich. (Assoc.)
Wilton L. Halverson, M.D., Woodmont, Conn., District Health Officer
Lawrence M. Lamont, Ann Arbor, Mich. (Assoc.)
William T. Madden, Ann Arbor, Mich. (Assoc.)
Ruth I. Parsons, Cambridge, Mass., Research Assistant in Health Education, M. I. T.
Wilfred T. Schoen, Saline, Mich. (Assoc.)
Milton W. Sharer, Ann Arbor, Mich. (Assoc.)

Public Health Nursing Section

- Helen C. Brennan, Lawrenceville, Va., Special Nurse, U. S. Public Health Service
Margaret M. Gustine, R.N., Ann Arbor, Mich. (Assoc.)
Vivian Legge, St. Albans, Vt., Visiting Nurse, Metropolitan Life Ins. Co.

Epidemiology Section

- Morris L. Grover, M.D., Providence, R. I., Director, Rural Sanitation, Rhode I. Public Health Commission

PUBLIC HEALTH ADMINISTRATION

Diphtheria in Bridgeport--Diphtheria had been extensively present in this city for 50 years until a new administrative program was put into effect by the Health Department in March, 1928. Prior to that date release was made on one negative culture from the nose and throat on two successive days. Subsequent to November, 1928, release has been made by multiple negative cultures from the nose and throat on two successive days, and the number of contacts to be cultured has been extended to include all women and children living under the same roof with the patient and likewise the fathers of patients or carriers. Fathers of contacts are examined only when they are food handlers. If a case occurs in a school child all members of the particular class involved are cultured.

A diphtheria immunization program was begun in 1926 and has resulted in the immunization of 51.2 per cent of the school children and about 26 per cent of the preschool group. The authors feel, however, that the immunization treatments have been no more important in the reduction of diphtheria in Bridgeport than the administrative measures established in 1928 which included briefly the release on multiple cultures, bacteriological examination of every possible contact, and the use of Loeffler's fresh blood serum, with or without chloroform, as a medium.—William F. Wild and Kathryn R. Tirrell, *Diphtheria Control in Bridgeport, Conn.*, *J. Prev. Med.*, 5, 303 (Sept.), 1931.

Typhoid in Richmond County—Richmond County is rural, with 35,000 people, two-thirds of whom are colored, and is situated on the southern border

of North Carolina near Pinhurst. A County Health Department was organized in November, 1924. During the 9 years prior to 1927 there was an average of 23 cases of typhoid reported yearly, while for the 3 years 1927-1929 the average was 5.3 cases per year.

Particular emphasis has been placed upon health education. An effort has been made to stimulate response from the negroes by approaching this group through their clergy. Results have been most promising and in addition to immunizations against typhoid fever, there were in the first 6 months of 1929, 1,500 protective treatments given against diphtheria among colored children. Smallpox vaccination has also been a by-product of the educational campaign. The authors feel that the greater percentage of the decrease in typhoid has been due to better methods of sewage disposal, especially in the towns of the county, where proper sewage facilities have been installed. North Carolina has a state-wide sanitary privy law which provides that a householder is not permitted to have any type of privy or system of sewage disposal within a mile of any municipality that has not been approved by the State Board of Health. Word of mouth information in the uneducated public has done much to cut down the typhoid fever death rate.—The Control of Typhoid Fever in Richmond County, N. C., A. B. McCreary, *J. A. M. A.*, 97, 998 (Oct. 3), 1931.

Relief in Tuberculosis in Syracuse—It is estimated that Syracuse spends annually about \$332,000 in its health and relief services for tuberculosis, of which sum 85 per cent is expended in health services and 15 per cent in re-

lief. Involved in this study were 1,288 tuberculous families known to the Health Department on May 1, 1929, of which number 296 families were classified as economically secure and therefore eliminated from the study. The remaining 992 families were divided into two groups, those who had received relief and those who had not but who had availed themselves of the free health or social services of the community. There were 211 families who had received relief and 781 in the second group. A survey was made of 34 families selected at random from the first group and 36 families from the second group. The conclusion is reached from the samplings made that most of the 781 families in the no-relief group were able to maintain an adequate standard of living. However, there is indication that about 80 of the families in this group were in need of relief. Among the 212 families who had received relief, it was found that in 150 instances the relief given was inadequate.

The general conclusion is that social service and relief in tuberculosis are on the whole totally inadequate to the requirements of the situation and most communities have developed their medical facilities for dealing with tuberculosis more adequately than their social facilities.—Bailey B. Burritt, Social Service and Relief in Tuberculous Families, *Quart. Bull.*, Milbank Memorial Fund, Oct., 1930.

Meningitis in Detroit—In the course of an outbreak of meningococcus meningitis, 6,416 home contacts of 1,272 meningococcus meningitis patients were examined and 685 carriers found among these contacts. There were also examined 1,991 persons not known to have been in contact with a meningitis patient and 19 of these were found to be carriers. The authors conclude that the relative frequency of home-contact

carriers cannot be used as a basis for predicting the termination of an epidemic. There was no evidence for either sex of a greater tendency to become carriers. The percentage of carriers among children between 1 and 10 years of age was slightly greater than among older children or adults and the lowest carrier rate was found among infants.

Of the contact carrier 27.6 per cent had meningococci in the nasal pharynx when they were released at the end of a 2-week quarantine period. Of the contact carriers released as negative before the termination of quarantine, 36.6 per cent cleared up within 3 days, 32.3 per cent between the 4th and 6th days, 21.1 per cent between the 7th and 9th days, and 10 per cent between the 10th and 14th days. There is no record of any of the persistent carriers having contracted meningitis. It is essential to make more than one examination to detect the carrier state. In this study 30 per cent of carriers located would have been missed if only one culture had been taken.—Meningococcus Meningitis in Detroit in 1928-1929, J. F. Norton and Irene Baisley, *J. Prev. Med.*, 5, 357 (Sept.), 1931.

Diphtheria Carriers—In Baltimore a study has been made of 3,449 individuals who have been exposed to diphtheria and cultured on the report of the primary case. Of this number 11.7 per cent were found to be positive on morphological diagnosis. There were more carriers among contacts under 10 years of age. Of 348 persons positive on primary culture and cultured again usually after an interval of 10 days, 44 per cent were positive. Among 1,971 individuals negative on primary culture, after 10 days 13.4 per cent were carriers. The total found positive in either primary or later cultures was 31.3 per cent for those under 9 years of age, 20.8 per cent for those 10 to 19

years old, and 19.6 per cent for those under 20 years of age. Examination of sample cultures showed 57.5 per cent of carriers to have virulent bacilli. The total virulent carrier rate for both primary and release cultures was 13.1 per cent.—Y. Kusama and J. A. Doull, Carrier Infection Among Family Associates of Diphtheria Patients, *J. Prev. Med.*, 5: 369 (Sept.), 1931.

Connecticut—The 1930 Department of Health report of Connecticut directs attention to the provision in many states whereby financial aid is available for the formation of district health departments, and indicates that such aid for the smaller towns of the state is desirable and necessary for the success of the district health department idea. Such aid could be furnished on the same basis as is state aid for public health nursing already provided.

During the year the health of the state was reported good, and the general death rate was 11.1, the second lowest in the history of the state. Plans have been perfected for a new building to house the department. An encouraging outlook in diphtheria is reported. Each mother to whom a birth certificate is sent is notified at the same time, and again when the child is 6 months of age, to have the child immunized against diphtheria. Many of the departments of health in the larger cities are doing likewise. Tularemia and undulant fever were made reportable diseases in 1928 and since that time the latter disease is being increasingly reported.

Good progress is reported in the institution of generalized public health nursing service, and there are now 100 towns and cities in the state reported as having such a service. An outstanding event in mental hygiene was an institute carried out for 3 weeks by the State Department of Health with the coöperation of the Connecticut College

for Women, the Connecticut Society for Mental Hygiene, the Hartley-Salmon clinic and numerous outside agencies that contributed personnel and aid toward its success.

In the laboratory there was a 12 per cent increase in examinations over the previous year. The division of occupational diseases reported 81 surveys and 25 studies of particular conditions carried on in coöperation with industries. The division of public health instruction notes among other activities 399 lectures by the personnel of the department, and 27 radio broadcastings, during the year.

Wood County, W. Va.—In the annual report for the fiscal year ending June 30, 1931, attention is called to health problems resulting from the severe drought, including the failure of water supplies which affected quantity and quality of many sources. The business depression is considered a causal factor in lowering the resistance of the people. Expenditures of this combined health unit last year amounted to \$12,000. A budget of 5 times this amount is suggested as desirable in a comprehensive plan of public health administration outlined in the report. Sir Lauder Benton is quoted on the opening page as follows:

Like other natural laws, the laws of health are inerrant; ignorance of the laws is not admitted as an excuse any more than motives; and the sentence for breaches is true now as it was ages ago. The soul that sinneth it shall die.

An epidemiological study of tularemia was made during the year, as several cases transmitted to man by handling of diseased rabbits occurred. This was made a reportable disease.

The county is fast becoming highly protected against diphtheria. Complete toxin-antitoxin administrations numbered 1,789; smallpox vaccinations, 808; and antityphoid inoculations,

2,162. There were 45 baby clinics held under the sponsorship of the Junior League with an attendance of 1,259.

We expect fire protection, good roads and an efficient educational system. We pay for these and we do this in a coöperative way. We must have an arousing of the health desire and buy it as we buy all commodities. Individual home owners must pool resources and go after this improvement as a group. Rudyard Kipling in a celebrated stanza has expressed the value of coöperation in accomplishing a desire:

For this is the law of the jungle,
As old and as true as the sky;
The wolf that shall keep it will prosper,
The wolf that shall break it must die.
As the ivy entwineth the tree trunks,
The law weaveth forward and back;
The strength of the Pack is the wolf,
And the strength of the Wolf is the Pack."

Winnipeg, Man.—On the basis of a population of 209,286, a corrected death rate of 7.6 per 1,000 population is reported for 1930. An infant mortality rate of 57.9 is noted. Attention is called to the epidemic index for diphtheria, which shows a decline continuing below the line of normal expectancy. The preventive work in schools and institutions is believed, in some measure, responsible for the lowering of the rates. There were 231 cases of pulmonary tuberculosis reported with 97 deaths, giving a corrected mortality rate from this disease of 51.6.

It is satisfactory to record that a larger proportion of the milk supply is being pasteurized from year to year. "We still regard this procedure as the greatest safeguard that can be adopted to protect the milk supply of a community."

Under legislation there is noted an amendment to the Public Health Act defining "maternity home" as a building where a woman or girl may be treated during pregnancy or accouchement, and providing that the department of health and public welfare may make rules regulating the management and conduct of child-caring institutions, maternity homes, and other institutions caring for patients, and cancel their permits on failure to comply with such rules.

Rhode Island—The first biennial report of the State Public Health Commission covers the years 1929-1930. Immunization of school children against diphtheria, begun in 1922, has been continued. A decrease in diphtheria death rate to less than half of what it was for the 5-year period before the work started is reported. But analysis of the records shows that over half the deaths from diphtheria occur under the age of 5 years. To reach the preschool child, the Division of Child Hygiene has arranged for immunization in preschool clinics. Emphasis is given in the report to the desirability of full-time health units.

A general death rate of 11.6, on the basis of a 1930 population of 689,524, is recorded, with a birth rate of 17.5. Infant mortality has been reduced over 60 per cent since 1900, the rate for the period 1925-1929 being 71.6. This report has been carefully prepared and contains much information regarding legislation and bureau activities under the newly organized public health commission.

LABORATORY

ANTIGENS IN THE WIDAL TEST

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PUBLIC health laboratory procedures must of necessity be standardized within certain limits, and as a consequence change is difficult and slow. This is well illustrated in the case of typhoid fever where the Widal test, recognized as the most useful diagnostic measure, has been carried on in the same manner for 30 years in spite of significant discoveries which, although amply verified, are still awaiting general adoption. A consideration of these contributions and the possibility of their inclusion in routine testing is the basis for the following study.

The recognition of the existence of dual antigens in many bacteria, first demonstrated by Weil and Felix,¹ has led to a material accumulation of knowledge on the antigenic nature of bacteria, and the studies in microbic variation have helped to hasten the day when laboratory workers in general might recognize that the supposedly specific antigens used in diagnostic tests and in the production of immunity were specific only within certain limits. The practical value of these investigations has apparently been appreciated in Great Britain more quickly than it has in the United States, and the recent summary of Topley and others² constitutes a challenge to the American laboratories.

Many bacteria, those of the enteric group in particular, have been shown to contain two antigens, one heat stable,

called the "O" antigen, the other heat labile, called the "H" antigen. The "O" antigen is generally conceded to be somatic in origin, the "H" antigen on the other hand is probably resident in the flagellar material. Under different conditions of growth the proportion of the two antigens will vary so that it occasionally happens that some strains will contain only pure "O" antigen. It is scarcely conceivable that an organism could consist entirely of "H" antigen, yet there are strains that contain a very high proportion of the flagellar substance.

Immunization with cultures having varying proportions of the two antigens results in serums having antibodies reacting with different degrees of intensity with each antigen, and this occurs whether the immunization is caused by an attack of the disease or by deliberate inoculation. In the test usually employed (agglutination) for the recognition of antibodies under these conditions, there is an easy and dependable method for distinguishing between the two types of response. The differences in the two types of agglutination are given in Table I.

In spite of this description, however, the recognition of the two types of agglutination is not always easy until the worker has actually seen suspensions of the two types. The British Medical Research Council has prepared suspensions of these two types, samples of

TABLE I.

"O" agglutination
granular
forms slowly
settles slowly
flakes small and uniform in size
supernatant fluid clear
sediment scanty and difficult to dislodge
"H" agglutination
flocculent
forms rapidly
settles rapidly
flakes large and varying in size
supernatant fluid cloudy
sediment voluminous and easily dislodged

which were sent to us through the kindness of Dr. W. W. C. Topley and Dr. A. D. Gardner. With these suspensions and their agglutinating serums, we were able to determine the type of antigen in routine use in our laboratory and to study serums sent in for diagnosis. The technical details follow:

1. *Preparation of Antigens*—Veal infusion broth, pH 7.48, was inoculated with Felix's typhoid strains, "O" 901 and "H" 901, incubated at 37° for about 20 hours, and killed with 0.2 per cent formalin. The suspensions were diluted with saline to conform in turbidity with the standard received. In character of agglutination the "O" compared very well with that prepared by the Lister Institute, but the "H" yielded clumping very similar to the "O." After several attempts to produce an "H" antigen with this culture, we gave it up. Our own antigen used routinely gave a very pretty flocculent agglutination. As it seemed

probable that the "O" was the antigenic factor that was added in the new technic, we decided to use only this in comparison with our routine test. The antigen used in this routine procedure is a saline suspension of organisms to which 0.1 per cent formalin is added.

2. *Serum dilutions*—Serum dilutions for the tests were from 1:40 to 1:640, or higher.

3. *Incubation*—Reading was made after 2 hours' incubation at 56° in a water bath. Final reading was made when the tests had stood overnight at room or icebox temperature. The 2-hour period is considered long enough to allow the "H" agglutination to occur, but we were advised that the test with the "O" suspension should not be read until it had incubated 4 hours, and that a longer period of 16 to 20 hours at 56° was necessary before final reading could be made. It was our experience that whether the tests were left at icebox, room, or water bath temperature after the primary incubation was immaterial, but that significant agglutination of the finely granular "O" type did occur during this added period.

4. *Reading*—We were advised to make readings by artificial light, or, if by daylight, to pass a finger up and down behind the tube. Our readings were made by daylight, and to the highest dilution showing clumps just visible to the naked eye.

The typhoid 703 is the strain used in the preparation of our diagnostic antigens. From Table II it will be seen that although our antigen contains both "O" and "H" antigen, it is more rich in the "H" fraction and hence is not satisfactory for determining the type of agglutination present in a given serum.

Using our regular antigen (703) and

TABLE II
COMPARISON OF OUR ANTIGENS AND SERUMS WITH THOSE OF THE LISTER INSTITUTE

Serum	Antigen	Agglutination
Our typhoid strain 706	Our typhoid strain 703	1:20,480 (flocculent) (titer not determined)
Our typhoid strain 706	Lister Institute "O"	1:1,280 (granular)
Our typhoid strain 706	Lister Institute "H"	1:20,480 (flocculent) (titer not determined)
Lister Institute "O"	Our typhoid 703	1:320 (granular)
Lister Institute "O" prepared by us	Lister Institute "O" prepared by us	1:5,120 (granular)
Lister Institute "H"	Our typhoid 703	1:640 (flocculent)

TABLE III

SERUMS POSITIVE WITH THE ONE ANTIGEN, NEGATIVE WITH THE OTHER

Positive with our Antigen, Negative with "O"			Negative with our Antigen, Positive with "O"		
Titer		Remarks	Titer		Remarks
1. 1:160	+	1. 1:160	.....	+
2. 1:40	+	2. 1:80	.....	+
3. 1:80	+	3. 1:320	.....	+
4. 1:80	?	4. 1:640	.....	+
5. 1:2,560	?	5. 1:320	.....	+
6. 1:320	?	6. 1:640	.....	+
7. 1:160	?	7. 1:320	.....	+
8. 1:80	?	8. 1:80	.....	+
9. 1:160	?	9. 1:80	.....	+
10. 1:320	?	10. 1:320	.....	+
11. 1:160	?	11. 1:640	.....	+
12. 1:80	?	12. 1:80	.....	?
13. 1:320	?	13. 1:80	.....	?
14. 1:80	?	14. 1:640	.....	?
15. 1:80	?	15. 1:160	.....	?
16. 1:80	—	16. 1:80	.....	?
17. 1:80	—	17. 1:80	.....	?
18. 1:80	—	18. 1:160	.....	?
19. 1:160	—	19. 1:80	.....	?
20. 1:160	—	20. 1:160	.....	?
21. 1:80	—	21. 1:320	.....	?
22. 1:40	—	+ Known to be typhoid.		
23. 1:80	—	? No data available		
24. 1:80	—	— Not considered typhoid		

the "O" antigen of Felix we carried out 419 tests following in all details the methods outlined above. In 307 instances the results were negative with both antigens, and in 70 instances both antigens gave a positive result. Our antigen picked up 24 positives which

were negative with the "O" antigen, but in 21 cases the "O" antigen gave a positive result when the "H" antigen was negative. As they stand these results have no relationship to the clinical situation however and it is, of course, impossible to state whether all of these positives represent actual cases. This brings up another question, namely, the value of these antigens in differentiating between the agglutinins of infection and those of inoculation. This we will consider briefly later.

Tables III and IV give the results of our efforts to determine the relationship between our results and the clinical condition, and present the actual titers obtained in those instances where positive agglutination was obtained.

It has been claimed by Felix that inoculation with heat-killed vaccines produces agglutinins of the "H" type while an attack of the disease results in

TABLE IV

SERUMS POSITIVE WITH BOTH ANTIGENS

59 serums had practically the same titer with both antigens.

11 serums varied as follows:

Our Antigen	"O" Antigen	Remarks
1. 1:80	1:200	+
2. 1:80	1:640	+
3. 1:2,560	1:160	+
4. 1:320	1:80	+
5. 1:5,120	1:320	+
6. 1:2,560	1:640	+
7. 1:160	1:640	?
8. 1:160	1:40	?
9. 1:40	1:160	—
10. 1:640	1:80	—
11. 1:80	1:80	—

the production of "O" agglutinins. Hence, it is argued that the presence of "O" agglutinins indicates infection in the individual concerned. Of course it is obvious that this would hold only if vaccines were prepared from cultures having a preponderance of "H" antigen, and it is further obvious that quantitative differences in the two agglutinins would result according to the vaccine in use at a particular time. We tested 22 serums from individuals previously vaccinated, using both antigens, and the results appear in Table V.

A casual study of this table reveals the relative accuracy of the claims of Felix. Although residual "O" agglutinins were present in some instances, they are present in quantity only after infection.

In connection with studies on the use of bacteriophage lysates as antigens for typhoid prophylaxis one of us (L) immunized numerous individuals with

bacteriophage. Although at the time this work was done a pure "O" antigen was not available, the small flaking type of agglutinin seemed to predominate. In the two instances shown in Table V the proportion of "O" antigen in bacteriophage immunized individuals was proportionately large. To be sure, these people later received vaccine, yet inasmuch as in no case did we find "O" agglutinins to such a high titer following vaccination, it would appear the result was caused by bacteriophage inoculation.

SUMMARY AND CONCLUSIONS

It is not our intention to make recommendations as a result of these studies. They are as yet too fragmentary and too limited. They do, however, verify the results reported from England and seem to us to indicate not only the desirability but the necessity for a recognition of these factors in the Widal test as done in this country. We have,

TABLE V
INOCULATED INDIVIDUALS—COMPARISON OF TITERS

Our Antigen	"O" Antigen	Date of Inoculation
	Negative	Unknown
1. 1:160	"	"
2. 1:160	"	"
3. 1:160	"	"
4. 1:80	"	"
5. 1:80	"	"
6. 1:80	1:80	"
7. Negative	1:80	"
8. 1:160	1:80	"
9. 1:160	Negative	"
10. 1:320	"	"
11. 1:80	"	"
12. 1:160	"	"
13. 1:40	"	"
14. 1:320	1:160	Bacteriophage 1929 Vaccine 1930
15. 1:320	1:320	Vaccine 1930
16. 1:320	1:640	Bacteriophage 1928 Vaccine 1930
17. 1:640	1:40	Bacteriophage 1929 Infection 1930
18. Negative	1:320	Bacteriophage 1929 Infection 1930
19. 1:640	Negative	Vaccine 1927
20. 1:640	"	Vaccine 1927, 1931
21. 1:1,280	"	Vaccine 1918, 1923, 1929
22. 1:80	"	

These people were not all at the time the tests were made. Residual "O" agglutinins are present in the inoculated though they are not found so frequently as the "H" type.

however, felt justified as a result of this work in including the "O" antigen in our routine diagnostic tests. After several months it would appear that this procedure more than justifies the slight increase in work.

REFERENCES

1. Weil, F., and Feltz, A. The Qualitative Receptor Analysis in its Application to Typhoid Fever, *J. Immunol.*, 9, 115: 1924.
2. Topley, W. W. C., and Wilson, G. S. *The Principles of Bacteriology and Immunity*. Vol. II, p. 993.

A MODIFIED A. P. H. A. MILK DILUTION PIPETTE

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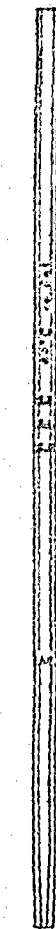
IN recent years a pipette calibrated to deliver both 1 c.c. and 0.1 c.c. has come into widespread use, especially in laboratories where many milk samples are plated. This 1.1 c.c. pipette, suggested by Dr. S. H. Ayers, U. S. Department of Agriculture, is recommended in *Standard Methods of Milk Analysis*¹ of the American Public Health Association. Probably this is why several laboratory supply house catalogs list it as the "A. P. H. A. Milk Dilution Pipette," although this style of pipette is commonly used in plating products other than milk.

Standard Methods cites the advantages of the 1.1 c.c. pipette for preparing two dilutions from the same water blank, for example, seeding the 1:100 and 1:1,000 plates from the 99 c.c. blank. Many laboratories prepare duplicate plates of the same dilution for incubation at the same temperature. Other laboratories likewise prepare duplicate plates, but incubate one set of plates at one temperature and the other set at another temperature. At any rate, with many laboratories making routine tests for thermophiles in milk and other products, the number of plates poured has been increased; consequently, a means of shortening the time of seeding plates without sacrificing accuracy or increasing the chance of contamination appears desirable.

These factors led one of us (P. S. P.) to design a pipette based on the 1.1 c.c. pipette, that enables the analyst to seed duplicate plates of two different dilutions from one filling of the pipette. This new pipette (see Figure 1) is calibrated to deliver 2.2 c.c. as follows: two portions of 0.1 c.c. each and two portions of 1 c.c. each.

Experimental lots of these pipettes were secured through the coöperation of a laboratory supply house.* The specifications of the 2.2 c.c. pipette follow closely the recommendations made by the committee of dairy bacteriologists that met in Geneva, N. Y., in 1926. Note that the bore is only slightly constricted at the tip; that the tip is blunt to prevent breakage; that the calibrations extend completely around the pipette; and that the distance between the 2.2 c.c. mark and the end of the pipette is sufficient for ease in handling and in filling the pipette without getting the liquid into the user's mouth.

FIGURE 1



* Will Corporation, Rochester, N. Y.

Calibration of these pipettes, by measuring mercury into them and also by weighing the amounts of milk which they deliver, showed that their variations came within the tolerances allowed for the standard 1.1 c.c. pipette.

These 2.2 c.c. pipettes were compared with the 1.1 c.c. pipettes by plating numerous samples of powdered and fluid milks whose plate counts ranged from a few hundred to several million per unit. Using the counts obtained with the 1.1 c.c. pipettes as a standard, the average per cent variation in counts obtained with the 2.2 c.c. pipettes was 5.2 per cent. The counts were based on duplicate plates of each dilution prepared; furthermore, the ratios between the numbers of colonies developing on the plates seeded with the 2.2 c.c. pipettes from different dilutions prepared from the same water blank were in proper proportion, i.e., approximately 10:1.

The saving of time is an important factor in favor of the modified pipettes. Using both standard 1.1 c.c. pipettes and the 2.2 c.c. pipettes, the average amount of time required to prepare consecutive dilutions from 1:100 through 1:1,000,000 and to inoculate duplicate plates from each of these dilutions was determined. It was found that the average time required when using the standard 1.1 c.c. pipettes was 12.4 per cent longer per dilution than when the 2.2 c.c. pipettes were used.

We are not unaware of the fact that

this pipette may be criticised because of its increased number of calibrations, for the larger the number of calibrations on a pipette, the less simple it is to manipulate. Furthermore, the smaller the volume that is measured, the larger is the per cent of error of the inaccuracies in measuring. However, these pipettes in the hands of laboratory technicians have given results that are as accurate as those obtained with the 1.1 c.c. pipettes recommended in *Standard Methods*. Another factor in their favor is that they are used only once for preparing duplicate plates of two different dilutions and are then washed.

Albus² has discussed the inaccuracies introduced in plate counts when the same pipette is used more than once. He found this factor to apply particularly to milk, especially in the lower dilutions. The fact that only one filling of the 2.2 c.c. pipette is required to inoculate the same number of plates as two fillings of the 1.1 c.c. pipette also lessens the possibility of outside contamination. Finally, with these 2.2 c.c. pipettes, a small but a distinct saving in time is made, a factor important not only in itself, but also in securing greater accuracy in the enumeration of bacteria by the plate-count method, since the interval of time between seeding and pouring the plates is decreased.

REFERENCES

1. *Standard Methods of Milk Analysis*, 1928, A. P. H. A., 5th ed., 1927, 68 pp.
2. *J. Bact.*, 16: 269, 1928.

VITAL STATISTICS

The Health Record for Delaware, 1930—The significance of the death returns for the State of Delaware cannot be appreciated without consideration for the unusual composition of the population of this state. According to the Census, there were in 1930 205,778 white persons and 32,602 colored, making a total of 238,380, of whom approximately 86 per cent were white and 14 per cent colored. Beside this composition factor, there is another which is important in the consideration of the deaths from various causes, i.e., a preponderance of persons of the higher age groups, influencing the death rates from certain of the degenerative diseases, which come with advancing years.

In view of these considerations, the 1930 general death rate of 13.6 per 1,000 population was a fairly favorable one, even though it was slightly higher than the 1929 rate of 13.2. The State of Delaware attained the lowest death rate from tuberculosis in its history, 50 per 100,000 for the white population and 190 for the colored, totaling 164 deaths in 1930 as compared with 194 in 1929. Grouping the 7 infectious diseases—typhoid, measles, scarlet fever, whooping cough, diphtheria, influenza, and tuberculosis—there were in 1930, 241 deaths from these causes combined, as opposed to 329 in 1929, a reduction of about 25 per cent. Typhoid and diphtheria were the only ones of these diseases to show increases, typhoid from 5 deaths in 1929 to 11 in 1930, and diphtheria from 14 in 1929 to 20 in 1930. Measles, whooping cough, and influenza showed marked decreases, measles from 6 to 2, whooping cough from 23 to 9 and influenza from 83 to 31, from 1929 to 1930.

There was a slight reduction in the

number of cancer deaths, from 244 in 1929 to 240 in 1930; of which number 217 were among the white population and 23 among the colored, the death rate from cancer being 70 per 100,000 for the colored and 106 for the white population. This extremely high rate among the white population was attributed partially to the preponderance of persons of the older age groups, which factor was considered important also in explaining the increasing death rate from diabetes, though in this case the rate for the colored population (28) exceeded that for the white (22). The infant death rate showed little improvement, the 1930 rate for the white population (71) being the same as that for 1929, and the rate for the colored population (126) being slightly lower than the 1929 rate of 133. There was an increase from 19 to 28 in the number of puerperal deaths among the white population and from 6 to 7 among the colored population.—*Delaware Health News*, 8: 14-18 (July-Aug.), 1931.

Health Conditions in England and Wales, 1930—According to the *Registrar-General's Statistical Review for England and Wales*, which has recently been published, the birth rate for 1930 remained the same (16.3 per 1,000 living population) as that for 1929, while the death and infant mortality rates reached new low levels in 1930. There were 38,908 deaths of infants under 1 year of age, giving a mortality of 60 per 1,000 live births as compared with 74 for 1929. Contrasted with this great reduction in infant mortality, there was a slight increase in puerperal mortality, which was 4.40 in 1930 as against 4.33 in 1929.

There were 455,427 deaths from all

VITAL STATISTICS

causes, giving a death rate of 11.4 in 1930 as compared with 532,492 deaths and a death rate of 13.4 in 1929. The tuberculosis death rate for 1930 was the lowest ever recorded in the country. The number of deaths from all forms of tuberculosis was 35,745 against 37,990 in 1929 and 36,623 in 1928. The death rate in 1930 was 89.8 per 100,000 population as compared with 95.9 in 1929; for pulmonary tuberculosis, the rates for 1930 and 1929 were 73.9 and 79.3 respectively. Others among the important causes of death, which showed striking reductions in death rate in 1930 as compared with 1929, were pneumonia, which dropped from 110.7 deaths per 100,000 in 1929 to 69.6; whooping cough, which dropped from 16.0 in 1929 to 5.1 in 1930; and influenza, which declined from 73.4 in 1929 to 12.6 in 1930. It is interesting to note a substantial reduction in the death rates from heart diseases (243.6 in 1929 to 226.4 in 1930); diseases of the arteries (56.6 in 1929 to 51.2 in 1930); and cerebral hemorrhage, apoplexy, etc. (63.7 to 60.7).

As contrasted with these reductions in death rates, there were increases in measles from 8.6 in 1929 to 10.5 in 1930; in cancer from 143.7 to 145.4; in suicide from 12.6 to 12.7; in chronic nephritis from 36.2 to 36.3, and in appendicitis from 7.1 to 7.4. Death rates which remained the same in 1930 as they were in 1929 were those for diabetes (14.2) and homicide (0.5).—*The Registrar-General's Statistical Review of England and Wales for the Year 1930.*

Provisional Birth, Death, and Infant Mortality Figures, U. S. Birth Registration Area, 1930—The Department of Commerce, through the Bureau of the Census, Division of Vital Statistics, recently reported provisional figures for the births, deaths and infant mortality in the U. S. Registration Area

(exclusive of Utah) for 1930. This area in 1930 included all of the United States except South Dakota and Texas, or 94.7 per cent of the total population in the United States. Figures for Utah were omitted because transcripts for 1930 had not yet been received from that state.

According to this report, the birth rate for 1930 was 18.9 per 1,000 population, the same as the rate for 1929. In 26 states birth rates were higher in 1930 than in 1929; in 12 states the rates were lower; and in 7 they remained the same. The highest birth rate (28.5) was for New Mexico. This state also attained the highest birth rate in 1929. The greatest increases in rates over 1929 were 1.9, 1.4, and 1.3 for Arkansas, New Mexico, and Arizona, respectively. The lowest birth rate (14.1) was for Oregon, which state also had the lowest rate in 1929.

The birth registration area (exclusive of Utah) had a death rate in 1930 of 11.3 per 1,000 population. This is 0.6 lower than the corresponding rate for 1929. When compared with 1929, 37 states had lower rates in the later year, 6 had higher rates, while the rate for 2 states did not change. The highest death rate (15.5) was for New Mexico and the lowest (7.9) was for North Dakota.

The infant mortality rate of 64.2 per 1,000 live births for 1930 was the lowest rate since the establishment of the birth registration area in 1915. Thirty-seven states had lower infant mortality rates in 1930 than in 1929. The greatest decreases were 17.1 and 10.2 for Arizona and Rhode Island, respectively. The highest rates were 144.9 for New Mexico and 116.2 for Arizona. The lowest rates were 48.4 for Washington, 49.2 for Nebraska, and 50 for Oregon.

From statistics of infant mortality for 86 cities having 100,000 or more inhabitants in 1930, only 21 of these cities showed higher rates in 1930 than in

1929. The highest rates were 108.8 for Chattanooga, 102.9 for Nashville, and 101.2 for Memphis. The lowest were 37.1 for Seattle and 39.8 for San Francisco.—*Pub. Health Rep.*, 46: 2373-2374 (Oct. 2), 1931.

Principal Causes of Death in Massachusetts in 1930—There was a decrease in the general mortality of Massachusetts in 1930 as compared with 1929, the deaths in 1930 numbering 49,503. Based on the U. S. Census population of April 1, 1930, these deaths correspond to a death rate of 11.6 per 1,000 population, which is the same rate as that for 1927, the lowest rate ever recorded in Massachusetts; the rate in 1929 and 1928 was 11.9.

More than one-third of the 49,503 deaths reported in 1930 were caused by organic heart disease (including pericarditis), pneumonia (including broncho-pneumonia), and tuberculosis, all forms. These diseases, together with cerebral hemorrhage, cancer, Bright's disease and nephritis, external causes, malformations and the diseases of early infancy, caused 75 per cent of the deaths for the year.

Pneumonia caused 4,043 deaths in 1930, or 95.1 per 100,000 population. It was responsible for 4,906 deaths, or 112 per 100,000 population in 1929 as compared with 106.9 in 1928. The deaths from heart disease in 1930 numbered 11,353, or 22.9 per cent of all deaths, or 267.2 per 100,000 population, as compared with 11,528, or 22.1 per cent of all deaths, or 263.2 per 100,000 population in 1929. Tuberculosis in its various forms claimed 2,734 victims in 1930, of whom 2,423 died from tuberculosis of the respiratory system. Deaths due to the latter cause constituted 4.9 per cent of all deaths during the year, as compared with 8.1 per cent for the 5 years from 1912 to 1916. In 1910, the death rate from pulmonary tuberculosis was 133.2 as contrasted with

57 in 1930. Cerebral hemorrhage was the cause of 4,108 deaths, or 96.7 per 100,000 population.

Cancer and other malignant tumors caused 5,813 deaths in 1930, corresponding to a death rate of 136.8 as compared with 129.5 in 1929. Of the deaths from cancer 28.4 per cent resulted from cancers of the stomach and liver. The death rate from cancer has risen from 89.9 in 1910 to 136.8 in 1930. The increase has been continuous. It is possible that at least a part of this increase is due to more correct diagnosis and greater care on the part of the physicians in making reports, but a part at least is due to the lengthened span of life, resulting in a larger number of people reaching the older age groups. Diabetes was the cause of 1,021 deaths in 1930, being responsible for a rate of 24.0 per 100,000 population. The rate from this disease has shown a steady increase for the last 5 years, being 22.8 for 1929, 21.5 for 1928, and 19.8 for 1926 and 1927. Bright's disease and nephritis were the causes of 3,617 deaths in 1930, corresponding to a rate of 85.1 per 100,000 population, as compared with 79 in 1929. There were 3,485 deaths caused by Bright's disease, and 132 by acute nephritis.

Congenital debility and malformations caused 1,929 deaths in 1930, corresponding to a rate of 45.4 per 100,000 population. Diarrhea and enteritis caused 572 deaths in 1930, or 13.5 per 100,000 population. For the last 10 years this rate has shown a marked decline. Of the total number of deaths, 71.7 per cent charged to diarrhea and enteritis in 1930 were of infants under 2 years of age. The rates from this cause for all ages have declined steadily, being 21.8 in 1926, 17 in 1927, 15 in 1928, and 12.6 in 1929. Diphtheria and croup deaths numbered 182, or 4.3 per 100,000 population in 1930. Typhoid fever has shown a steady decline since

1910, having dropped from 12.2 in that year to 0.9 in 1930. This decline is greater, relatively, than that shown for any other important cause of death.

Alcoholism caused 214 deaths in 1930, a decrease of 67 from those in 1929 and corresponding to a rate of 5 per 100,000 population. Influenza was responsible for 270 deaths, or 6.3 per 100,000 inhabitants, as compared with 352.7 in 1918, 17 in 1926, and 27 in 1929.

The principal epidemic maladies of childhood (whooping cough, measles and scarlet fever) were together responsible for 417 deaths of both adults and children, or 9.8 per 100,000 population in 1930, the rates for the three diseases separately being 4.3, 3.2, and 2.3 respectively. Death rates from violence during the past 5 years per 100,000 population were 79.3 in 1926, 79 in 1927, 82.5 in 1928, 81.8 in 1929 and 82.3 in 1930. Automobile accidents and injuries caused 799 deaths in 1930, or 18.8 per 100,000 population, which is a slight increase over the last few years.—*Annual Report on the Vital Statistics of Massachusetts, 1930.*

Births and Deaths in South Australia—In many respects the latest returns from the State of South Australia show vital indices with which western Europe is familiar. A birth rate declining more rapidly than the death rate, a corresponding decline in the rate of natural increase of population, and considerable reduction in the mortality from

tuberculosis, but an increased loss from cancer. Both the birth rate (17.2 per 1,000) and the crude death rate (8.4 per 1,000) were in 1930 the lowest in the records of the state.

For many years South Australia, in common with the other states of the Commonwealth and New Zealand, has had a very low mortality rate for infants under 1 year of age, compared with other countries. In 1930 it was as low as 48 per 1,000 live births. The annual mean death rate of infants under 1 year of age for the 5 years 1895–1899 was 110, and for the 5 years 1925–1929 only 47—a fall of 63. Most of this improvement is shown to have taken place at ages above 1 month and under 12 months.

The death rates under 1 month, under 1 week, and under 1 day of age show very little progress and the great majority of those dying under 1 month of age died from prenatal causes. These facts indicate the direction in which efforts for the saving of infant life should be directed. The Mothers' and Babies' Health Association, of which there are 44 branches in the state, is endeavoring to improve the position.

Over half the population are resident in the "metropolis," defined as an area approximately within a 10-mile radius of the General Post Office, Adelaide, and roughly equal proportions of the working population are employed in agricultural and industrial occupations.—*Lancet*, 2: 415, 1931; *Canad. M. A. J.*, 25: 506 (Oct.), 1931.

PUBLIC HEALTH ENGINEERING

CONTAMINATION OF MAINS BY JUTE PACKING

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THE practice of sterilizing new mains after laying and before placing in service is recognition of the fact that water has been found below bacteriological standards when drawn from new pipe. Brush¹ states that in New York City it has been the practice for many years to place chloride of lime in new mains, but the discussion of his paper and that of Absher² brings out that few of even the largest cities of the United States were sterilizing new mains in 1925. The adoption of this measure of safety in many places shows progress during the past 5 years, but even now the practice has not become general. For example, Kehr³ states that in Kansas, which we regard as a progressive state in sanitary affairs, mains are simply flushed after laying.

Kehr brings up a point which is particularly pertinent to the present discussion, namely, the *persistence* of contamination in unsterilized mains, lasting from 3 to 12 months and averaging 6½ months in 9 cases. The same picture is presented by Olson and Wright⁴ in a case where a whole year elapsed before a count of 3,000 *B. coli* per 100 ml. subsided to 1 per 100 ml.

The significance of the bacterial counts in these cases was unknown and likely to be questioned. In discussing Absher's paper, Catlett, while obviously favoring sterilization, incidentally dis-

counts the significance of the *B. coli* findings in new mains for reasons not given. Kehr mentions no cases of sickness resulting from unsterilized mains; nor do Olson and Wright. Sullivan⁵ finds 1 instance in which a state board of health attributed to unsterilized mains several cases of typhoid which could not be allocated elsewhere. One can understand that the evidence would likely be tenuous in such cases. On the other hand, the sanitary survey generally indicates the need of sterilization. Mains often lie near sewers. Frequently sewers must be broken in running a main. There are many known hazards and others unknown. Certainly, to sterilize the main before placing in service is a step in the right direction. However, if we eliminate the sources of contamination, the job may be easier.

There is ample evidence that the coliaerogenes group has been found so profusely under apparently innocent circumstances that it has been somewhat discredited as an index of pollution in those circumstances. Gerstein⁶ describes errors in sampling water from Chicago tunnels due to *B. coli* on leather packing, and mentions similar experiences related by Houston.⁷ Greer and Kells⁸ grew *B. coli* in enormous quantities on leather washers submerged in water. I have⁹ found *B. aerogenes* growing abundantly on pump packing; and Mellen¹⁰ has had similar experience. Mallman¹¹ reports *B. coli* from small pressure water systems of unquestioned safety; and more recently

* Presented before the Public Health Engineering Section of the A. P. H. A. at the Sixtieth Annual Meeting at Montreal, Canada, September 17, 1931.

the Illinois State Department of Public Health has eliminated *B. coli* from a well supply by inserting layers of HTH between the packing rings in the gland of the pump.¹²

The 1929 report of the Committee on Water Supply of the A. P. H. A.¹³ is devoted to aftergrowths of bacteria including *B. coli* in mains, showing the influence of organic matter, particularly algae, from open reservoirs. Baylis¹⁴ has demonstrated the growth of *B. coli* on dead plankton. Thus we see that *B. coli*, though admittedly the best criterion we have, cannot be accepted blindly as indication of serious pollution; and it becomes highly desirable to know their origin when present.

The writer has had considerable experience with aftergrowths of coli-aerogenes following the installation of new mains, the mains having been heavily chlorinated in each case. In some cases the bacteria found belonged to the *B. aerogenes* classification and their importance was discounted, as seems justified by present knowledge. In other cases, typical *B. coli* has been found in concentrations of 100 to 1,000 per 100 ml.; and it has been necessary to flush and chlorinate repeatedly in attempts, which were not always successful, to eliminate the offending organisms. One might expect a satisfactory sample from a main which appeared physically clean when laid; which had been plugged whenever work was interrupted, as at night; which was thoroughly flushed and then treated with chlorine in such concentration that 180 p.p.m. remained after standing 48 hours. Yet immediately following such a treatment, *B. coli* has been found in 0.1 ml. as soon as the chlorine was removed by flushing. Such behavior suggests a source of the organisms which the chlorine cannot reach effectively.

Such a source may be the common jute packing which is perhaps universally used to yarn the joints of cast iron pipe lines before the lead or joint compound

is poured. For those who are not familiar with this operation, it may be described briefly as follows:

The small or spigot end of a length of pipe is placed in the bell end of the adjoining length. This leaves an annular space formed by the bell around the spigot, which space is to be filled with melted lead. A ring of jute yarn is pushed or driven into the back of this space to close the crack between the pipes and prevent the molten lead from flowing into the main before it solidifies. A gate is then placed in front of the opening and the metal is poured. The yarn remains in the system in a position which is very difficult to reach with a disinfectant, since the only communication with the main stream of water is a narrow crack between the two lengths of pipe. Furthermore, it is capable of absorbing extremely high concentrations of chlorine, so that the small amount of chlorinated water penetrating this space is entirely inadequate to sterilize even when the concentration of chlorine is high.

There are various grades of jute packing. It is customary in ordering to specify tarred, untarred, or unoiled. The tarred jute is said by one manufacturer to be little used for water pipe on account of the odor. So-called untarred jute is lubricated with oil and is used extensively, as is also the unoiled, which is the dry fiber. Special grades of unoiled jute are available under various trade names or brands.

A considerable number of samples of jute submitted by jobbers and factories have been examined, as well as several department stocks. The method of examination is simple. One-tenth gm. of the fiber is taken aseptically from an inner strand of the twist and placed in a flask containing 100 ml. of sterile, distilled water. This is allowed to stand over night at laboratory temperature, after which a series of dilutions is planted in lactose broth, or in some cases Noble's pour plate medium has been used. Usual confirmation methods are employed. The results of examination of the first fifteen samples are shown in Table I. There are two tarred sam-

TABLE I
SHOWING CULTURES PRODUCED BY 0.1 GRAM SAMPLES

Number	Description	Coli-Aerogenes per Flask after 24 Hours	Coli-Aerogenes per lb. Jute
1	Unoil	1,000	4,500,000
2	Untarred	0	0
3	Braided (Dry)	0	0
4	Untarred	10,000	45,000,000
5	"American Hemp"	Innumerable	—
6	"Italian Hemp"	5,400	24,000,000
7	Unoil	21,000	95,000,000
8	Tarred	0	0
9	Untarred	63,000	285,000,000
10	Unoil	16,000	72,000,000
11	Unoil	50	226,000
12	Tarred	0	0
13	Untarred	10	45,000
14	Braided (Dry)	0	0
15	Special (Dry)	0	0

ples, both of which were sterile. There are four other sterile samples, three of which are grades sold at a premium and probably not generally used. The remaining nine show coli-aerogenes group in the flasks ranging from 10 to 63,000.

Assuming jute in the mains will produce at the same rate, the number per lb. will range from 45,000 to 285,000,000. If the flasks are examined after 48 hours or longer, the numbers have increased 5 to 10 times, or even more. This group of contaminated samples is believed to represent jute which is widely used for water mains as it includes samples which were first submitted. One manufacturer has recently sent in a sample which was sterile and had probably been sterilized by steam. It is possible that some sterilized jute is now being sold.

In order to simulate conditions in a main, jars were made of short bell fittings into which plugs were leaded, using portions of the packing under examination to hold the lead. The plug then formed the bottom of the jar with the packing exposed to the water as in

a main. No pressure was available to force the water through the small crack into intimate contact with the jute, and, therefore, in making the joint, the plug was kept from seating snugly by inserting a wire across the pipe, thus leaving the jute more exposed to compensate for lack of pressure. Sterile water placed in these jars made up with the sterile grades of packing remained sterile. When the other grades were used, various concentrations of *B. coli* were obtained.

Samples of contaminated jute used in making the joints were exposed over night to water which contained 9 p.p.m. residual chlorine. The result was sterile water on the following day, but upon replacing the highly chlorinated water with sterile tap water, abundant contamination appeared in 24 hours. One example is sufficient for illustration, viz., the jar chlorinated for 24 hours and refilled with tap water contained no *B. coli* immediately after refilling; but in 24 hours it was positive for *B. coli* in 0.1 ml.; and in 48 hours it was positive in 0.01 ml.

The significance of this contamination

is next to be considered. The fact that nearly all jute comes from India is not reassuring to an occidental. The fiber is derived from the bark of two closely related plants, *Corchorus capsularis* and *C. olitorius*, which have been cultivated in India for several centuries at least, and which form the basis of an important textile industry. They grow 5 to 8 ft. high, and when the crop is ripe they are cut and tied in convenient bundles. The following excerpt is taken from the 1929 edition of *Encyclopedia Americana*:

Extraction of fiber is accomplished by steeping the bundles in stagnant water, covering them with jungle plants, clods of earth or cow dung. When the setting is complete, the ryots go into the water waist deep and by threshing the surface of the water with the stalks, assisting the loosening of the bark with the fingers, the fiber is separated from the wood.

In justice of India it may be pointed out that samples of American and Italian hemp, so labeled, did not make a better showing.

From the results cited, not all jute would seem to have been treated in the unsanitary manner described by the *Americana*, because a few samples were clean in appearance and likewise sterile. The sterile brands, as before stated, sell at a premium, the price being almost twice that of the common grade. On the other hand, it has been found to cost less per joint of pipe because it is smoother, stronger and goes further. Jute packing can of course be sterilized by steam.

Using sterile jute, however, does not necessarily dispose of aftergrowths of coli-aerogenes in new mains. Opportunities for contamination are plentiful in this environment. The first rush of water carries the dust of the pipe into the crack containing the jute, and the trouble may be thus started. It is probable that the practice of dumping copious quantities of chloride of lime or perhaps permanganate of potash at the

joint is the most effective means of preventing this initial contamination. In any event, the jute yarn is likely to act as a nuisance.

From these observations we may conclude that

1. Jute is a source of contamination in new mains
2. Sanitary and unsanitary lots are on the market.
3. Chlorination of a main is an unsatisfactory method of sterilizing jute packing.
4. Jute should be shown to be free from the coli-aerogenes group before being used for water pipe packing.

REFERENCES

1. Brush, W. W. *J. Am. W. W. Assn.*, 17, 1 79-86 (Jan.), 1927.
2. Absher, C. W. *J. Am. W. W. Assn.*, 15, 1: 52-59 (Jan.), 1926.
3. Kehr, R. W. *Proc. Eighth Ann. W. W. School, Univ. Kansas*, 1930, pp. 86-89.
4. Olson, W. M., and Wright, H. L. *J. Am. W. W. Assn.*, 20, 2: 229-233 (Aug.), 1928.
5. Sullivan, E. C. *Proc. Eleventh Texas W. W. School*, 1929, p. 106.
6. Gerstein, H. H. *Eng. News-Rec.*, 101, 11: 407, 1928.
7. Houston, Sir Alex. *Twelfth Rep. Res. Met Water Board*.
8. Greer, F. E., and Kells, L. C. *W. W. & Sewerage*, 26, 9 (Sept.), 1929.
9. Spaulding, C. H. *J. Am. W. W. Assn.*, 21, 8, 1093 (Aug.), 1929.
10. Mellen, A. F. Not published.
11. Mallman, W. L. *J. Am. W. W. Assn.*, 21, 7: 944 (July), 1929.
12. Illinois State Dept of Health, Eng. Div. Private communication.
13. Report of the Committee on Water Supply (A. P. H. A.). *A. J. P. H.*, 20, 5: 485 (May), 1930.
14. Bayliss, J. W. *W. W. & Sewerage*, 77, 10: 335-338 (Oct.), 1930.

Unemployment Relief—With the approach of winter the matter of providing gainful work for the nation's unemployed becomes more and more impressing. Municipalities and state governments are striving to provide funds to carry on constructive programs that will provide necessary municipal facilities and relieve unemployment. With municipal credit capable of extending construction costs over a period of years, there is every reason that it should be employed to alleviate the present situation.

New York City started work on a

\$300,000,000 project to dispose of its sewage properly. Los Angeles voted \$200,000,000 for an additional water supply from the Colorado River. Smaller cities have felt the influence of the taxpayers' leagues, bond markets, etc.; yet there is a vast amount of urgent work to protect the public health that should be done. The adequate disposal of sewage is a problem confronting thousands of American cities. The need for more extensive water supply and treatment plants was felt by hundreds of communities during the recent drought. The need of mosquito control in and about hundreds of communities in the South and along our seacoast is apparent if malaria fever is to be eliminated and workmen allowed to work undisturbed by hordes of mosquitoes. The need for adequate human waste disposal in unsewered areas is present in thousands of American towns. Clean Up Programs, that is, removal of unsightly tin cans, debris from vacant lots, clean up of city trash dumps or building of satisfactory reduction plants, the rat proofing of our water front structures, the provision of adequate play areas for the children, the creation of parks and picnic places; the demolition of structures condemned for human habitation, and the removal of the so-

called slum area from our American cities—all these directly or indirectly affect public health.

Health departments should be actively interested in unemployment relief, and now is the time to get the sanitation projects under way. Labor is cheap, material is cheap, and the unemployed need work. Clean up the sewage disposal plant, put it in operating order or build a new one. Develop that additional water supply and new purification plant. Fix up the sanitation about the city limits. Get rid of malaria and dengue fevers, and do the drainage or cleaning up work to prevent mosquito breeding. Health departments shall lead the way. Public health can best be protected by having work on health protecting projects carried on.

Your A. P. H. A. Committee on Economic Aspects of Public Health Engineering Projects urges health officers to present forcibly the benefits to their communities of such engineering projects that will combine public health protection and unemployment relief.

E. L. FILBY, *Chairman*

A. C. DECKER

H. W. VAN HOVENBERG

H. P. EDDY

W. J. ORCHARD

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FOOD AND NUTRITION

Vitamin Content of Turnip Greens, Collards, Cantaloupes and Peaches—The methods used for determining the vitamin A, B, and C content of turnip greens, collards, cantaloupes and peaches were based on the Sherman technic. Studies were made on the turnip greens raw, boiled and canned. One oz. of raw turnip greens contained 1,418 units of vitamin A, approximately 14 of vitamin B and 95 of vitamin C. Greens boiled 45 minutes contained an equal amount of vitamin A but only 14 units per oz. of vitamin C. Greens boiled 2 hours contained 6 units per oz. of vitamin C. Canned greens which had been blanched in boiling water contained 7 units per oz. of vitamin C, while the steam blanched canned product contained 14 per oz.

Raw collards were found to contain 1,418 units of vitamin A per oz., about 28 of vitamin B, 28 of vitamin G, and 57 of vitamin C. Collards boiled 2 hours had lost no appreciable amounts of their vitamin A, B, or G content, but contained only 14 units of C per oz.

Fresh yellow cantaloupe was found to contain 95 units of vitamin A per oz., about 7 of vitamin B per oz., and 10 of vitamin C per oz.

Frozen Elberta peaches were found to contain approximately 14 units of vitamin A, and less than 0.5 of vitamin C per oz. The frozen Hiley variety of peach contained less than 14 units of vitamin A and less than 0.5 unit of vitamin C per oz.—Catherine L. Newton, Georgia Exper. Sta., *Bull.* 167 (Aug.), 1931.

Vitamins in Canned Foods—XI. A Canned Food Diet—The experiments here reported were directed primarily to a study of the stability of the

vitamins to the canning process. Tests for vitamins A, B and C were made. The canned foods were purchased at grocery stores and represent those available to everyone. The foods were not irradiated nor did the animals receive irradiation or direct rays of the sun.

Three pairs of young guinea pigs, weighing 320 to 430 gm., and one pair 3 weeks of age, and 3 pairs of young rats, 23 days of age weighing 53 to 56 gm., were placed on a diet consisting entirely of canned foods sterilized by heat. When this report was made, the experiment with rats had been in progress for 15 months and that with guinea pigs for 12 months. During this time, the rats had reached the 5th generation and the guinea pigs the 3d.

Each generation was thriving as well as under any conditions. Reproduction was as prolific as could be expected, the size of the litters normal, in every way, and lactation was adequate. The rate of growth and weight at maturity was much higher than that reported as normal. The evidence indicates that canned foods may supply every dietary requirement, including vitamins B (B_1) and C, so often referred to as heat labile.—E. F. Kohman, W. H. Eddy, and Celia Zall Gurin, *J. Indust. & Eng. Chem.*, 23: 1064 (Sept.), 1931.

Salmon Oil and Canned Salmon as Sources of Vitamins A and D—In this experiment, albino rats weighing 40 to 45 gm. were placed upon a vitamin A-deficient ration, as follows: alcohol extracted casein, salt mixture IV, agar, yeast, dextrinized corn starch and peanut oil. When distinct symptoms of ophthalmia occurred, the curative tests were begun. The salmon oils used were humpback, sockeye, chum, chinook, and

silver. Curves are given showing the different results obtained. It is apparent that the oils vary widely in their vitamin A potency and there was a striking correlation between depth of color and vitamin potency. The oils which showed a distinct reddish cast, as chinook and sockeye, contained more vitamin than chum which had practically no red color. Oils from the offal of salmon of the 5 species were found to be excellent sources of vitamin D. Three of such oils, humpback, sockeye, and chinook, were fully twice as potent as a medicinal cod liver oil, chum oil about 50 per cent more potent, and silver oil about equal to cod liver oil in vitamin D.—C. D. Tolle and E. M. Nelson, *J. Indust. & Eng. Chem.*, 23: 1066 (Sept.), 1931.

Vitamin A Content of Body Oils of Pacific Coast Salmon—These were made to secure quantitative data upon the relative vitamin A content of body oils of 5 common species of Pacific Coast salmon widely used as food. The common names of the 5 species are Chinook, Sockeye, Silver, Humpback, and Chum. The vitamin A content of the body oils was determined by the biological assay recommended by Sherman and Munsell and for comparison a medicinal cod liver oil was used as a control.

Young albino rats, 28 to 29 days old, weighing 35 to 55 gm., were placed on a vitamin A-free diet, otherwise adequate. When their bodily store of vitamin A had been depleted, they were replaced in individual cages and their diet was supplemented by the oils being tested.

Each animal received daily 93 mg. of chinook oil, 186 mg. of sockeye oil, 226 mg. of silver oil, 227 mg. of humpback oil, 221 mg. of chum oil, and 1 mg. of cod liver oil. All the salmon body oils tested were found to be decidedly inferior to a medicinal cod liver oil of high grade as a source of vitamin A.

Chinook and sockeye oils were found to contain more vitamin A than the other three oils tested.

Two hundred and twenty-seven mg. of humpback oil barely maintained life over the 8 weeks, and 221 mg. of chum oil failed in all cases but one to do so, the animals dying within from 5 to 7 weeks. It is noted that the vitamin A content of these oils falls in the same order as fat content of the flesh as determined by Shostrom, Clough, and Clark (*Ing. Eng. Chem.*, 16: 283, 1924), and, with the exception of the chinook, the reddest fish were also the richest in this vitamin.—R. W. Truesdail and L. C. Boynton, *J. Indust. Eng. Chem.*, 23: 1136 (Oct.), 1931.

Chemical Changes in the Fat of Frozen and Chilled Meat. I. Frozen Mutton and Lamb—In the experiments here reported, changes in the chemical composition, appearance and flavor of the fat of carcasses of lamb were observed during precooling, cold storage at -5° , -10° , and -20° for periods up to 7 months and during hanging at room temperature subsequent to storage.

A temperature of -5° failed to prevent the growth of molds and yeasts on the carcasses. No visible growth occurred at -10° or -20° , and the fat of the meat stored at the 3 temperatures did not seem to be attacked by microorganisms when held for 3 days at a mean temperature of 12° subsequent to storage.

The free acidity values recorded were of the order of 1.2 per cent (as oleic acid) for external fat and much less for kidney fat.

II. Chilled Beef—In the case of chilled beef, oxidation of the fat was not sufficient to render it unpalatable, provided undue exposure to strong light was avoided. Portions of the fat, particularly the front edge of the breast were, however, found to acquire, on

prolonged storage, a tainted flavor. Measures, such as the use of air circulation, or of a storage temperature of -1.6° in place of 0° , which produced conditions less favorable to the growth of microorganisms were found to extend the storage life of the fat and hence of the meat.—C. H. Lea (*J. S. C. I.*, 1931, 50: 207-213 t, 215-220 t). Abstract *J. S. C. I.*, 50: 779 (Aug. 21), 1931.

Chemical Changes in the Fat of Frozen and Chilled Fat. III. Frozen Bacon—The experiments were undertaken to discover the cause of the deterioration in the fat during storage and to obtain information on the keeping qualities of the fat of (1) smoking, (2) variations in composition of the feed including the addition of cod liver oil in small quantities to the diet, and (3) immediate cooling of the pork at 5° C. (40° F.) after dressing instead of at ordinary temperature.

The free acidity values observed in the fat of tank-cured bacon during storage at -10° for periods up to 152 days followed by hanging at 15° for 18 days gave no indication of attack by microorganisms on the fat, nor were any signs

of tainted flavor observed. The superficial fat of freshly cured bacon was found to contain small quantities of active oxygen which rendered the fat very susceptible to further oxidation during storage.

When stored at a temperature of -10° the exposed surface of the fat oxidized rapidly, but without developing any appreciable yellow color in 152 days. At 15° the bacon was found to become yellow on the surface and, after cold storage, sometimes in the interior of the fat. On cooking the oxidized portions of the fat had a rancid flavor. Smoking considerably improved the resistance of the bacon to attack by microorganisms, the surface of the bacon being practically free from mold, while the controls were badly contaminated with white and green molds and yeasts.

Rapid cooling at 5° prior to curing seemed to have no appreciable effect on the fat. The addition of cod liver oil to the diet, even in small quantities, appeared to have a harmful effect on the keeping qualities of the bacon, although no effect on the iodine value of the fat. —Colin H. Lea, *J. S. C. I.*, 50: 343 t (Sept. 11), 1931.

INDUSTRIAL HYGIENE

Industrial Hygiene in New York State—The New York State compensation law schedules 27 occupational diseases and poisons of which only 18 were mentioned in applications in 1930. While it is possible to prove that the compensation act has resulted in a positive economy to the manufacturer, proof is not at hand to show that prevention of occupational diseases has been of monetary benefit to him.

The Division of Industrial Hygiene had its origin in the recommendations of the New York State Factory Investigation Commission of 1912. Thus the primary object of the division today is the prevention of industrial accidents and occupational diseases. The background of the efforts may be stated in a few words:

The population of New York State, on April 1, 1930, was 12,588,066, of which number about 3,000,000 came within the operation of the workmen's compensation act. New York, like other states, has a small number of large plants and a large number of small plants; e.g., there are hardly 400 plants in the whole state which have 500 employees or more, although there are 60,000 establishments whose output is \$5,000 or more per annum. About 92 per cent of the establishments have 50 employees or less. Also, the state has no less than 200 industrial groups, each one with a great variety of occupations. During 1930, 109,848 compensation cases were closed (at a cost amounting to \$35,243,703), of which 423 were due to occupational disease lasting for a week or more. Less than \$1,000,000 a year is provided for prevention, of which only one-tenth is spent on industrial hygiene. Even in

the large establishments, which afford medical departments, there is very little evidence of activity by plant physicians in the prevention of occupational disease.

The division's secondary functions are to assist in the operation of the workmen's compensation act, to provide information for the Industrial Board and other divisions of the Department of Labor as well as the medical profession and the public. In the matter of prevention the chief function has to do with accidents since, roughly, only 0.5 per cent of all present compensation cases are occupational diseases.

The staff of the division comprises 24 persons, including medical inspectors, chemists, safety inspectors, engineers, plan examiners, investigators, safety lecturers and demonstrators, and clerical help.

The medical inspectors visit industrial plants to determine the cause of occupational diseases and to ascertain whether conditions are inimical to health as well as to determine specific hazards such as lead, carbon monoxide, or chromium. The chemists secure samples of materials alleged to be dangerous and analyze them, and likewise make determinations of atmospheric conditions. The engineers examine plans and ventilating systems in accordance with the industrial codes. During 1930, 683 ventilation plans were submitted for approval, of which 605 were approved and 78 disapproved. Also 6 studies or monographs on accident causes and prevention were made in addition to lectures, exhibits, demonstrations and special statistical studies.

The reporting of occupational diseases by physicians on the standard

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official certificate (Form 313) is practically inoperative for several reasons such as the inclusion of only a few of the more obvious diseases on the schedule, the failure of many physicians to recognize an occupational disease, and the lack of remuneration for reporting the same as well as a penalty for failure to do so. Therefore, information regarding occupational diseases is difficult to get and the chief sources come from the compensation act and certain requests and hearings.

During 1930, 770 cases of occupational diseases were reported, the chief being: lead 350, benzol 36, chromium 29, carbon monoxide 21, dermatitis about 150. A considerable reduction of lead cases is expected as the result of the action of the principal lead battery manufacturers which have followed the recommendations made by the division; thus, whereas 254 lead cases were reported in 1930, there were only 15 during the first 6 months of 1931.

The medical staff has prepared several monographs, e.g., on lead, carbon monoxide, and chrome poisoning, and more recently a series of "industrial hygiene leaflets" to inform physicians, employers and workers about occupational poisons and diseases. It has been found a most difficult thing to popularize knowledge of occupational diseases where they occur only here and there in the vast extent of the state.

In the future, closer coöperation is to be sought with the state and municipal health authorities whose help is needed and whom we need to help. Likewise, the extension of the division is to be hoped for and expected with far more stress on prevention as well as the inclusion of all occupational diseases in the compensation act. It is highly necessary that a clinic be set up for the purpose of diagnosis, prevention, and determination of sensitivity. The extension of publicity is also desirable.—J. D. Hackett, Director, Div. Indust. Hyg.,

New York State Dept. of Labor. Abstract of paper presented before the Industrial Hygiene Section of the A. P. H. A. at the Sixtieth Annual Meeting at Montreal, Canada, September 15, 1931.
E. R. H.

The Eastern Interstate Conference on Labor Legislation, June 18-19, 1931—The conference, held in Harrisburg, was called by Governor Pinchot and was composed of representatives of the governors of a considerable area of eastern states for setting standards for labor legislation to meet the needs of an industrial area. The conference was made up of representatives from the states of Connecticut, Delaware, Maryland, Massachusetts, New Jersey, New York, Ohio, Pennsylvania, and West Virginia; and the U. S. Department of Labor.

The discussion was limited to the consideration of standards for workmen's compensation, for employment of women and children, industrial health, and labor statistics, and recommendations as to minimum standards. This is considered the beginning of a movement which recognizes the needs and problems of industry irrespective of state boundary lines, and a continuing body was appointed to meet again for further study of the questions involved.

Recommendations of the section on industrial health referred to the following features: ventilation, temperature, humidity, lighting, air space; drinking water; toilet facilities, wash and dressing rooms; lunchrooms; seating facilities; cleaning and physical upkeep of places of employment; first aid; general health consideration (referring especially to building construction and equipment); and occupational diseases.

Simply, "adequate standards" were recommended for ventilation, temperature, humidity, lighting, etc., and it was prescribed that specific minimums be not adopted in the law on these points but

that power be lodged in the administrative authorities of each state to establish such standards. The highest standards now found in existence in labor laws are to be considered as well as consultation with the U. S. Public Health Service, the American Public Health Association, the American Standards Association, the National Safety Council, and other similar organizations.

It was also recommended that reports of all occupational diseases shall be rendered by all physicians diagnosing and (or) treating such cases, and by all employers having knowledge of cases of such diseases among their employees. "Protective devices and measures necessary for the prevention of any or all occupational diseases shall be required."

Other sections dealt with recommendations on employment offices and on the matter of statistics. A fairly large number of prominent persons were assembled to compile the recommendations of the various sections.—Pennsylvania Dept. of Labor & Industry, *Labor & Indust.*, 18, 7: 3-17 (July), 1931.

E. R. H.

Committee Reports—Four of the various committees of the Section on Industrial Hygiene rendered reports at the Montreal Meeting as follows:

The Committee on Standard Practices for the Compensation of Occupational Diseases, of which Dr. Lanza is Chairman and for which Dr. Kessler read the report, devoted its time to the subject of Silicosis, urged on by the situation in New Jersey, the recent conference in South Africa, and the experience of Ontario; and considered the matters of administration, standards of diagnosis, time of exposure, and compensation. By order of the Section, this committee was instructed to combine with the Committee on Pneumoconiosis (below) and to render a joint report which was done at a later session of the same meeting.

The Committee on Pneumoconiosis, of which Dr. Sayers is Chairman, rendered a report to further uniformity of terminology and definitions, stages and diagnosis of silicosis, and was requested to render a combined report with the above named committee as indicated, Dr. Sayers to be Chairman of the Joint Committee.

The Committee on Industrial Fatigue, of which Dr. Eugene L. Fisk, deceased, was Chairman, presented a report by Dr. Frederick B. Flinn, Acting Chairman, which referred to the maintenance of the bibliography on this subject and several features in the study of fatigue and the committee was instructed to proceed under Dr. Flinn.

The Committee on Lead Poisoning, of which Dr. Hayhurst is Chairman, exhibited a complete bibliography for the year 1929, and distributed mimeographed copies containing brief abstracts of part of this, the work being the accomplishment pretty largely of Clareiss T. Rayne, Secretary of the Association's Committee on Research and Standards; also, a statistical statement for the year 1929 prepared by Dr. Fredetick L. Hoffman, a member of the committee. Furthermore, Dr. Joseph C. Aub, a member of the committee, presented a paper accompanied with X-ray illustrations upon "The Significance of Bone Trabeculae in the Treatment of Lead Poisoning."

The four reports of the above named committees will be printed in the Association's *Year Book*, except the extensive bibliographies in connection with some of them, which may be obtained either in part or in whole from the Association's headquarters. E. R. H.

Silicosis in the Abrasive Powder Industry—Recently, in New Jersey, over 100 cases of silicosis are alleged to have occurred in the abrasive powder industry, involving 4 companies which pumped up sand by hydraulic pressure

to a plant where it was washed, steam dried, screened into various sizes and then pulverized in closed tube mills. The free silica content of the completed product was approximately 99.24 per cent, and of the order of $1-5\ \mu$ in size. The silica powder was packed by mechanical means into large cotton bags. Dust arose at the tube mill and in packing, although apparently efficient exhaust ventilation was present; also, in handling and carting the bags. The men wore ordinary Wilson type respirators; positive pressure air-line masks having been found impractical or inefficient. Another place of hazard was bag cleaning and repairing, usually done by women. Young colored adults were employed in the main mill room.

Silica powder is used in about 20 industries, especially the glass, pottery and abrasive cleaner industries.

While most of the claimants were employed at or near the packing operation, others were in the wet processes, and several women were in the bag cleaning work. Six persons have died and have been autopsied by Dr. Martland of Newark. Many others have been reported to have died but the results of the autopsies in these cases are not known. Of 40 X-rays of cases reviewed by the author only 4 could be called ante-primary, although some others showed varying degrees of fibrosis without characteristic mottling.

The most outstanding feature of these cases has been the allegedly short exposure period—apparently as brief as 4 months to $1\frac{1}{2}$ years. Others have had an exposure as long as 6 years. Many of the cases have been seen by competent observers and studied by roentgen rays and reported as first or second stage silicosis.

In comparable experience, Irvine, of South Africa, has observed only 1 case which occurred in less than 6 months' exposure—this in a miner who was confined in a very small work space; Hay-

hurst (in Ohio) found only 1 case with 1 year or less of exposure in 919 sandstone quarry men; D. G. Robertson, of Australia, found the average period of employment in mine workers with detectable silicosis to be 21 years in surface work and 26 years in underground work; Adelaide Smith, in rock drillers and blasters in New York City, found the shortest exposure to be 3 years; Muller reported 3 years in sandblasting; Kraestle 10 years in the porcelain industry; Bohme 10 to 15 years in stone-borers. Mavrogordato reports 10 to 11 years as the mean duration of exposure before the disease is clinically recognized, while Sutherland and Bryson report 20 years in the sandstone industry before the disease is recognized. The Ontario Silicosis Scheme places a minimum of 3 years' exposure in the stone industry and 5 years in the mining industry before compensation is paid. This has been done to distinguish between fibrosis and other disease or dust exposures than silica, for the law compensates silicosis only.

The New Jersey situation therefore appears unique in the matter of the short length of exposure "or that fibrosis due to other causes is being mistakenly regarded as silicosis."

While the plants concerned have taken precautionary steps, further engineering improvements are desirable, as well as shorter hours with alternation of exposure periods, medical examinations and the addition of some chemical agent to the silica powder which will take up water from the atmosphere and keep it moist without impairing its properties.

(In the considerable discussion which followed the presentation of this paper it was brought out that preemployment examination of these workers had not been made so that the possibility of longer periods of exposure to silica was present, while both the author of the paper and the discussants felt that much more intensive work should be done on

the situation before deriving final conclusions.)—Henry H. Kessler, M.D., Newark, N. J. Abstract of a paper presented before the Industrial Hygiene Section of the A. P. H. A. at the Sixtieth Annual Meeting at Montreal, Canada, September 15, 1931.

E. R. H.

Asbestosis Bodies in the Sputum: a Study of Specimens from Fifty Workers in an Asbestos Mill—Author's summary:

The inhalation of asbestos dust in high concentrations leads to the appearance of asbestosis bodies in the sputum in a large percentage of the workers exposed thereto. They were

present in 48 out of 50 workers examined.

Asbestosis bodies were as easily demonstrated by direct thick films as by the antiformin method.

The sputum was always mucoid in character when there were no bronchial complications. It may resemble egg albumen. In none of the sputums were tubercle bacilli demonstrated.

Study of the intracellular asbestosis bodies in these cases suggests that they are formed by the deposition on the asbestos fiber of an iron-containing substance elaborated by the cell.—F. W. Simson and A. Sutherland Strachan. *J. Path. & Bact.*, 34, 1931, 4 pp.

E. R. H.

CHILD HYGIENE

HEALTH OF THE ADOLESCENT

NO one who is at all familiar with problems relating to adolescence will doubt that the health equilibrium during this period, from both the psychological and physical standpoints, is rather unstable. Growth and development during adolescence are very perplexing. The significance of this period is probably least understood of all the periods of growth, and demands concentration on special studies of many kinds.

During adolescence we cannot apply the same standards of growth and development as are used during earlier periods. It has been clearly pointed out by many investigators that in this period there is lag in both height and weight, and that this is followed by a distinct spurt in growth after the 15th year. The acceleration of growth as a factor in weight begins somewhat earlier in girls than in boys. For the most part the tables of height and weight which have been used as criterions for malnutrition should be laid aside and judgment should be based upon careful physical and mental examinations of the child, together with a survey of his health habits. There is a great need for a better construction of standards of growth and development in the adolescent child. Growth implies not only increase in height and weight, but also increase in the integration process of the organism on its way toward maturity. Within each individual there seems to be an inherent power of growth toward a goal or pattern, and this applies to the individual organs and the body as a whole.

A wider knowledge of the social and emotional experiences, in relation to growth, through which the child passes in adolescence is extremely important. It is a period of constant, and sometimes rapid, changes of the individual parts of the body, and of one or another part in relation to the whole. While a considerable amount of literature has appeared in recent years dealing with various phases of adolescence, we still are in doubt about certain of the processes of growth, and especially concerning the exact action of the endocrines. There is no question that the endocrine glands exert powerful influence upon the adolescent development of both sexes. Ample evidence is at hand, showing that development of the sex glands is closely related to the functioning of the thyroid and pituitary bodies. At this period there is intimate relation between the growth of the long bones and development of fundamental muscles. Both of these give to adolescent development its chief characteristics of increase in weight, height, and body growth. It is well known also that the muscles are intimately related to every other system in the body.

During the second decade there is a greater demand for activity on the part of the large skeletal muscles and this is manifested by the interest of the adolescent in outdoor sports requiring considerable endurance. Disproportion in growth between muscle and bones, or between two sets of muscles, may take place, resulting, as we know, in awkwardness, slovenly gait, poor posture, and asymmetrical development. This is

a period in which the growing youth needs particular attention from the standpoint of corrective exercises and skillful direction of athletic sports. The growing muscles demand oxygen and fuel, and this leads to distinct changes in the circulatory and respiratory systems. There is evidence to show that before the accelerated growth of adolescence the heart is relatively small in proportion to the large blood vessels. During adolescence the heart develops rapidly in size and in strength of beat, and its capacity enlarges. The vital capacity of the body is also increased considerably. It is a serious question whether the skeletal muscles do not grow at a greater rate than the heart during this period, thus placing an extra burden upon the latter, especially during strenuous exercises.

We know, from clinical evidence, that the heart of the adolescent boy or girl is prone to be affected by the acute communicable diseases. It is very important, therefore, to examine carefully every adolescent boy and girl returning to school after one of the infectious diseases. A number of unpleasant incidents have been reported in which the boy or girl has suffered from acute dilation of the heart when playing strenuous games, such as basketball, after having had influenza or one of the other acute infectious diseases. The question naturally arises whether the strain to which the heart is subjected during adolescence will manifest itself later in weakness and premature breakdown. On the other hand, the healthy, normal heart of adolescence makes very rapid adjustment, and compensates for the damage done in other respects.

One of the most difficult problems at present is the increase of tuberculosis among high school children. For several years there has been noted a distinct tendency for tuberculosis rates to rise among adolescent girls. This has been attributed to many factors, such as

chronic fatigue, fads in dieting, and scanty clothing during the winter months. Studies are now being conducted in a number of places which reveal the origin during adolescence of the adult type of tuberculosis. This brings forcibly to us the importance of very careful examination, supplemented with X-rays, of high school students.

Studies concerning absenteeism in secondary schools have revealed sickness as a major cause of absence. Diseases of the upper respiratory tract and gastrointestinal diseases appear to be the most important ones among high school population. The acute communicable diseases, other than common colds and influenza, do not seem to play a large part in absenteeism. It has been found that when the secondary school employs a capable nurse, who can check up on the absences and follow up cases to the home, the number of days of absence has been reduced considerably. This gives the nurse an excellent opportunity not only to conduct classes in personal hygiene in the school, but also to use the occasion of her home visits and her contacts with the teachers to enforce the lessons of hygiene and sanitation.

One of the most important disorders, occurring in the Great Lakes region and in the mountainous areas of the United States, is simple or adolescent goiter. Using the epoch-making work of Marine, Lenhart, and Kimball, we are in a position to prevent this type of goiter. The regular administration of small quantities of iodine, consistently carried out, especially to girls between 12 and 16 years of age, has decreased considerably the percentage of goiter. Medical examiners and nurses in the high schools should constantly be on the look-out for signs of this disorder. Many of the girls having it are hyper-active, very intelligent, and make high grades; they are usually thin and nervous, and have rapid heart action. Some of these cases

have been confused with tuberculosis, but the diagnosis may be made readily by means of thorough physical examinations, basal metabolism tests, and the use of the X-ray and tuberculin.

Provision should be made in the high schools so that girls having slight ailments and needing periods of rest may have the use of comfortable cots. The exercise of both boys and girls should be regulated carefully so as to adapt itself to the requirements of each individual child.

Problems of nutrition come to the front of this period. Bad habits of eating and poor selection of food begin to show results in lack of vitality and fatigability of the high school boy and girl. Ample provision should be made

for a lunchroom where well balanced meals, including a liberal supply of milk, are served. Definite instructions should be given regarding values of the food elements and the composition of foods. Something should be taught as to the relative cost of different foods.

This brings us to the whole problem of health education in secondary schools. There are a number of subjects with which health may be correlated in the secondary schools, but it is important, in addition, that some one individual be made responsible for bringing about this coordination and keeping in close touch with all the activities of the school which bear upon the child. This need is being met in some places by a health coordinator or correlator.

PUBLIC HEALTH NURSING

The Development of Nursing in China—Nursing as a profession has been known in China for comparatively few years. In this regard "New China" is slowly emerging from the isolation of ages. However, there are millions of Chinese who still believe in the presence and power of demons. Charlatans thrive in producing charms and amulets to combat the attacks of ills which afflict the human body which are supposed to be caused by the visitations of specters.

Chinese doctors of the old school are found everywhere. They use quaint drugs and wonderful prescriptions, and scientific training is not considered necessary for them. The same is true of the midwives; they have no special training, but what they know has been passed down from their mothers and grandmothers. They do untold harm as they do not know the rudiments of cleanliness or asepsis.

But Chinese women are now being trained as nurses and doctors due to the early activities of the Christian missionaries who realized the need of proper medical care for Chinese mothers. Twenty years ago the Nurses Association of China (N. A. C.) was formed; this gave impetus to the training of Chinese girls for nursing. In 1929 the N. A. C. sent 5 delegates, 3 of whom were Chinese, to the International Council of Nurses Quadrennial Congress held in Montreal, Canada. It was at this meeting that the N. A. C. became affiliated with the Council.

At the tenth biennial conference of the N. A. C. in 1930 the Minister of

Health of the Chinese National Government in an address said that it was estimated that there was only 1 nurse in China to about 200,000 people. The President of the N. A. C. at the same meeting said, "Properly trained nurses who are able to give instruction and advice in health matters are a necessity. The education of nurses is a public responsibility."

Now the Government of China is taking great interest in the training, registration and protection of nurses. The General Secretary of the N. A. C. has been appointed Director of Nursing Service of the Ministry of Health.—J. G. Cormack, Another Aspect; The History of Chinese Nursing. *Nurs. Times*, 1375: 971-972 (Sept. 5), 1931.

Public Health Nursing in Rural Industrial Communities—In a rural community, assembled to promote some industry, the problems of hygienic and wholesome living and the problems of sanitation are accentuated. It is fair to consider the public health work of a large concern like the Consolidation Coal Company of Pennsylvania, West Virginia, and Kentucky as an example of what should be done in all rural industrial communities to make the "bodies and minds" of their employees to "function normally."

Ten thousand employees of the Consolidation Coal Company and their families are scattered in mining communities in the 3 states named above. The territory is divided into 6 divisions, the minimum distance between any 2 being 60 miles, and the maximum 300 or more miles. Because of these scattered areas it has been necessary to establish 14 medical units with 23 phy-

* Please send printed matter or other material relating to public health nursing to Eva F. MacDougall, 6 State House Annex Indianapolis, Ind

sicians, 12 staff nurses and 1 supervisor. In Elkhorn Division in southern Kentucky there is a fully equipped 50-bed hospital which has been approved as a first class hospital by the American College of Surgeons.

The few cases of communicable disease speak well for the immunization program. In all the communities the applicant is given a physical examination and if accepted he and his family receive typhoid and smallpox vaccination immediately.

The charge for medical service to the employees and their families is \$1.00 for a single man and \$1.50 for a married man, and this amount is deducted in each case from the pay roll. An extra charge is made by the physician for obstetrical and venereal disease cases.

A school health program similar to that being installed in the schools of Pennsylvania was instituted last year.

The 12 public health nurses, dressed in dark blue silk uniforms and carrying black leather bags, fitted for their varied activities, inspect school children, make home visits, conduct mothers' classes, and boys' and girls' clubs, distribute health literature, and conduct infant welfare clinics. A full-time dentist is employed for some of the schools.

A monthly sanitary inspection of camps, and milk and water supplies, is made by the sanitary squad, which includes the personnel manager of each division, the superintendent, the doctor, nurse, and a representative of the Building and Civic Improvement Department. Recommendations made by this squad are given serious consideration.

The company issues a monthly newspaper which is extensively used as a health advertising medium.

Since the time of the inauguration of this program in 1927, through a continuous process of education, the communities have learned to appreciate that when a work of this kind must be limited for economic reasons, much more

can be accomplished through a preventive than through a curative program—Hilda S. Nelson, R.N., Public Health Nursing in Rural Industrial Communities, *Trained Nurse & Hosp. Rev.*, Aug, 1931, p. 208
V A J.

A Western Experiment in Nursing Education—The education of the nurse has had to be broadened in recent years to keep pace with the advances in the field of medicine. More comprehensive courses in the laboratory sciences have called for increased laboratory equipment and facilities, which entail a greater outlay of funds than most hospitals have available for this purpose, unless they increase their revenue by raising the cost to the patient or rely on philanthropic individuals. Nurses render service to the public, and it seems only logical that the public, which pays for the education of doctors, lawyers, and practically every other professional group, should be given the chance to participate in the education of nurses.

Nursing education leaders have worked hard to interest educational institutions in affiliating with nursing schools to give pupil nurses varying amounts of instruction not only in the basic sciences but also in basic and technical and professional subjects included in a 5-year course leading to a B.S. degree.

When the Board of Education of the City of Los Angeles, Calif., opened its Junior College in 1929 the California League of Nursing Education, Southern Branch, appointed a committee to arrange an affiliation between nursing schools and the college. A pre-nursing course of study covering 1 full year at the Junior College was planned for students wishing to enter schools of nursing. During the year 1930-1931 the California Lutheran Nursing School, the Methodist Hospital Nursing School, and the Bishop Johnson College of Nursing participated in this joint arrangement.

Some advantages of the arrangement:

1. The laboratory equipment is much more complete than the ordinary nursing school could afford.

2. Subjects are taught by specialists in each particular line with years of teaching experience behind them.

3. The student nurses have contact with other college students.

4. It helps eliminate the undesirable student, as the Junior College drops the student at the end of 10 weeks if she fails to pass in 10 units.

The greatest possibilities for developing nursing education along the lines demanded by advancing medical science and practice seem to lie in schools that are independent of, but affiliated with, hospitals and colleges; that are controlled by the League of Nursing Education, and supported by State funds.—Lena E. Moede, R.N., *The Los Angeles Experiment in Nursing Education*, *Western Hosp. Rev.*, Oct., 1931, p. 16.

EDUCATION AND PUBLICITY*

Ill-Advised Advisers—A picture, "Night Nurse," recently released emphasizes a danger which crops up in unexpected places. For the argument against this picture see "Powerful Defense by the American Hospital Association" (*American Journal of Nursing*, Oct., 1931) which states that

The picture is a distinct reflection upon the hospital operation and its portrayal of the character of the nurse reaches a point where it approaches the scurrilous.

A letter from the Motion Picture Producers and Distributors of America states that

... the studio affected secured the services of an eminent physician in California and followed his advice regarding the details of hospital technic as well as the portrayal of the nurses and physicians as shown in the picture.

Not long ago a commercial food association issued a pamphlet of doubtful utility to the schools to which it is being supplied. "The pamphlet was approved by a leading educator," was the reply to a letter in which we questioned its use in schools.

Because of quirks in the judgment of individuals and the all too common lack

of analytical minds almost any proposal in health education may find its endorser among leaders in professional groups.

It is no light responsibility to advise commercial interests or health agencies as to the validity of their data and the form of presentation. It is easy to be too up to date in sponsoring ideas not finally accepted by science. It is equally possible to cling too long to discarded notions. Personal prejudices and limitations of our own experience need to be checked.

Advertisers may guard against mistakes by consulting widely before choosing advisers. And professional advisers may well seek consultation with others in the profession.

Instruct Your Representatives—Suggestions for the program and other activities of the Public Health Education Section are invited by its officers in preparation for the January meeting of the Section Council.

Awards But No Contest—All varieties of educational publicity material will be considered by the Awards Committee of the Social Work Publicity Council. Whatever the form, whatever the source, the committee will

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

evaluate it on whatever consideration it seems to call for recognition. All material sent to this department, as well as what goes to the S. W. P. C., will be in line for awards.

Borrowed Gems—Good ideas and good writing, and pictures, too, are being passed on to other audiences.

The noted borrowings in bulletins or house organs have included quotations from daily papers, *Hygeia*, city and state bulletins, general magazines, and press releases of radio talks.

Ohio, Massachusetts, New York State, Michigan, Lincoln, Detroit, Texas, Massachusetts Mental Hygiene, Oakland Health Center, and Wisconsin Anti-Tuberculosis bulletins were among those quoting from the wealth of good material which might well be passed on to additional audiences.

They Have So Much to Share—Last winter about 50 book people met a number of times fortnightly in New York City. They are meeting again at intervals this winter. All they have to discuss is the planning of the paper, typography, printing and binding of books.

Is it possible that small groups of those concerned with public health education could get together to discuss how to get people to read, to listen, to act?—and how to that end to make use of printed matter, radio, motion pictures, and the whole range of mediums available for awakening interest and spreading information?

Food Store Window Displays—Bellevue-Yorkville and East Harlem Health Centers, New York, both had grocery window display contests this fall. Awards were made on the basis of the food values of the stock displayed, as well as for its selling effectiveness.

In addition to the details of the contest plan as worked out by the two

health centers two points may well be considered when such contests are put on in other cities:

1. To provide a colorful placard or poster (amateur-made or otherwise) to tie up the window with the current food selection campaign—and to emphasize that such selected foods are sold in that store
2. To give information about—or better—to provide copies of window display suggestions to be secured free from display material manufacturers.

A brief memorandum of such material now available will be supplied by the editor of this department. Enclose an addressed and stamped envelope.

Told To The Public—What health departments in various cities and states think the public ought to know is revealed by the topics of press releases sent out. Among news releases received by the editor of this department this fall are the following titles:

Connecticut: "Midwife Institute"; "Does Your Child Grow?" "A Protective Measure"; "Poliomyelitis With Respiratory Paralysis"; "Sleep and Growth"; "Oyster Season Is Now On"; "Nutrition To Be Discussed"; also news about Department activities.

Detroit: "Prophylaxis of Ringworm for the Feet in School Children"; "Tuberculosis: An Important Cause of Death Among Children"; "The After Care of Infantile Paralysis"; "Toxoid as a Prophylaxis Against Diphtheria"; "Poliomyelitis"; "Diphtheria On The Increase—Why?"

Iowa: "Sewage Disposal"; "Wash Your Hands"; "Teachers Should Report Cases of Disease"; "Diphtheria in the Offing"; "Whooping Cough"; "A Fifteen-Dollar Blooded Calf"; "Heart Disease"; "Too Much Small Pox."

Maryland: "Oysters Are On The Menu Again"; "You Can Protect Them Against It" (diphtheria); "Defines Dental Decay"; "Seasonal Sickness"; "Health Insurance for the Six Year Molars"; "Don't Let These Things Go On"; "Start the Day With a Good Breakfast"; "Extension of Full-Time Health Service."

New York State: "Does It Make Any Difference What We Eat?" "The Closed Season For Garages"; "The Control of Communicable Diseases Among Children"; "Does

Your Child Have Good Teeth?—Regular Dental Attention Helps"; "Cancer"; "Swimming Pools and Their Effect on Health"

Oregon: "Health Problems of Swimming Pools"; "Food Poisoning"; "Rheumatism"; "Eating Sprees"; "The Control of Communicable Diseases Among Children"; "Prevent Colds"; "Report Diseases"; "Control Infantile Paralysis by Early Diagnosis and Prompt Treatment"

U S Public Health Service. "International Sanitary Relations of the U S P. H S"; "Rat-proofing of Ships"; "Preparing the Child For School"; "Cancer"; "The Prevention of Goiter"; "Sport For Health's Sake"; "Work of Employees' Mutual Benefit Association"; "The Fight Against Diphtheria"; "Hygienic Adjustment in Middle Age"

National Society for the Prevention of Blindness and New York City releases were not titled.

Of course many other city and state departments issued news material, and voluntary health organizations, of which none were received.

Write your own "moral," if any, to the above.

A New Medium—Gummed address-labels in red, black and white (cancer campaign symbol in white on black) are offered to contributors of \$1.00 or more to New York City Cancer Committee, 34 East 75th St., New York. The letter and reply slip carry the propaganda.

Radio in Racine—A series of 15 radio health episodes given by the Health Department, Racine, Wis., measure up well with the general run of commercial radio dramatized "sales talks." The conversation is easy, natural, entertaining and the propaganda worked in an ingenious, interest sustaining manner.

The subject is the safe and refreshing vacation of the Martin family. The mother is a sensible, cautious person, the father a hard working business man, the 18-year old George and the 15-year old Mary, modern young people with the gift of quick comebacks. The terse

conversation moves along with the good-natured chaffing heard in every family where real regard is covered with a veneer of sharp give and take.

First Mrs. Martin consults the Health Department about vacation precautions. Her plan for a long hike is changed to the use of the car with supplementary hikes, a warning against unusual unaccustomed exertions. We hear the family pack, treat sunburns, drive leisurely, pick camp, search for a pure water supply, all on advice previously obtained from their health department. Hear them have their little jokes while they guard their health:

Mary: I thought a scout was always observant.

George: Oh, did you? Well, they are. And they don't need signs and tags to tell 'em when a well is no good

Mary: I'm so glad you're not going to disappoint me

George: Aw, go climb a tree!

Mrs. M.: Well, anyway, George, if you didn't see those signs, why didn't you use the well water?

George: In the first place, the cover was made of boards, and they were dirty and rotten, and water could leak through them right back into the well. In the second place, the waste water wasn't drained away from the well. And the pump had to be primed—

Mrs. M.: Not when Mary tried it.

Mr. M.: Possibly that was because George and I had just primed it.

George: And—there was a barnyard up the hill from the pump. Did you see that, Mary dollink?

Mary: Eh—why, of course

George: Yes, you did—not!

Later they pick a clean restaurant through specific observations:

Mary: Well, here's your barbecue. Let's eat.

George: Does it pass the board of censors, Mom?

Father: It's got screens.

Mother: And the food is in glass cases.

Mary: So are the dishes.

George: And the girl back of the counter's got a clean apron.

Mary: What color hair has she got?

George: Brown. Sa—ay, what's it to you?

Mary: I just thought you'd surely notice that.

They visit relatives in a small town with a health hazard, typhoid fever. Arriving home well and refreshed, they find neighbors, who gaily omitted the precautions taken on their trip, ill with typhoid.

The series was interrupted once with an interesting episode designed to introduce the members of the Health Department giving the broadcast, including Dr. W. W. Bauer, who wrote the series, and Mrs. Bauer. An opportunity is made to describe the fine new quarters of the Health Department.—HELEN CAMPBELL.

NEWSPAPERS

The annual directory of newspaper feature syndicates appeared in *Editor and Publisher*, Times Bldg., New York. Aug. 29, 1931. 10 cents. Twelve health columns are edited by Drs. Copeland, Evans, Brady, Sophia Brunson, Clendening, Fishbein, McCoy, Galdston, Schumann and Bundesen. Editorial comment is offered by 12 syndicates. Some of the writers might use carefully selected material from health agencies. Crossword puzzles are supplied by 14 syndicates.

EDUCATIONAL MATERIAL

"An Important Message from the Health Commissioner" appears on the address side of a folded card, double postal card size. The inside is a type-written letter from the Commissioner of Health, New York State, addressed to "Dear Madam," urging increased milk consumption. Though reduced to the size of the double inside page the message is quite readable. It is distributed with the bills of milk companies.

Your Baby Needs Protection Now. Division of Health, Cleveland. 4 p. folder. Simplest possible statement about diphtheria and smallpox, with clinic information. The dark paper is a bit gloomy. *Free*.

Food for Children. Dept. of Agri-

culture, Washington. 20 p. Displaces Food for Young Children, a former Farmers' Bulletin. *Free*—while free edition lasts.

Four-fifths of the supply of Farmers' Bulletins is placed by law at the disposal of members of Congress for free distribution by them. It is therefore suggested that when Farmers' Bulletins are desired in quantity, request for them be made of a member of Congress.

The Health Guards. Canadian Dental Hygiene Council, Medical Arts Bldg., Toronto. 32 p. booklet; simply written; addressed to children and mothers.

Let's Grow—Be Healthy and Happy. Tuberculosis and Health Society, 51 Warren Ave., West, Detroit. 10 cents. 10 to-be-colored pictures of animals and birds illustrating 10 health rules, with jingles. One page shows penguins, and

Body straight and head erect
Is the posture to select.

Health Education Materials. Dairymen's League, 11 W. 42d St., New York. Revised catalogue.

Healthy Teeth. John Hancock Mutual Life Insurance Co., Boston. 11 pages. "Ought to do much towards giving men and women a basis for accepting or rejecting the truths or half truths with which they are bombarded." *Free*.

A group of booklets from Metropolitan Life Insurance Co., 1 Madison Ave., New York:

Good Habits For Children

Good Teeth

The Conquest of Typhoid Fever

First Aid

Above are revised editions, with new covers, and without distracting ornament on text pages. *Free*.

TITLES AND PHRASES

"From Stable to Table"—*Health*, New Haven.

"The Forty-Five Million" (children in U. S.)—*Mouth Hygiene Quarterly*.

"What Two Cents Accomplished." New York City Dept. of Health. Meaning the annual per capita expense for the 3-year diphtheria campaign closed last month.

"What One Can See In Figures"; "One or One Hundred?" "When a Thousand is Better Than Two Thousand"; "A Mountain Which Will Be Eaten Up"; "Things Which Make Things": some chapter headings from New Russia's Primer.

NEW

Birmingham's Health, Jefferson County Board of Health, Birmingham, Ala. Attractive printed front and back cover; 5 or 6 pages mimeographed monthly.

Health Finder, W. Va. Tuberculosis and Health Assn., Charleston, W. Va. Monthly.

The Junior Crusader, Wis. Anti-Tuberculosis Assn., 1018 N. Jefferson St., Milwaukee. 4 pages; punched for loose-leaf binder. Also used by Michigan Tuberculosis Assn. Monthly.

Mouth Health Quarterly. American Mouth Hygiene Assn., Essex Bldg., Minneapolis. \$4.00 a year. A distinguished Advisory Board and Board of Trustees. Type, paper and page-layout make for easy reading. Interesting illustrations of materials and methods from several countries

And farewell to *Missouri Public Health News*, State Dept., because of "the extreme decrease in the state revenue."

RADIO

Contrast the attention values of two radio titles (both addresses by the same educator!): "The State's Responsibility for the Education of Its Children" and "Safeguarding the Farmer's Best Crop."

Connecticut State Dept. broadcasts every Thursday, 1:25 to 1:30 p.m., via NTIC. Topics and speakers have been

announced from Sept. 3 to June 30. Copies of the talks will be sent upon request.

Some of the Conn. broadcast titles: "The Fall Crop of Brides," "Deferred Payment," "Watch Your Step," "The Sniffle Stage of Disease," "The Tragic Loss of Mothers," "Nagging," "Fat Mothers and Thin Children," "Before Germs Were Known," "Placing That Queer Member of Your Family."

Some titles from Dr. H. W. Haggard's popular Sunday night broadcasts: "Yellow Jack," "A Family Disease," "The Menace of Middle Age," "The Dancing Mania," "The Apothecary," "Athletics with Safety."

MAGAZINE ARTICLES

"Almost Every One Has Infantile Paralysis"—*Literary Digest*. Oct. 31, 1931.

"Disease, Its Cause and Prevention," by Prof. J. E. Greaves. *Science Monthly*, Lancaster, Pa. Nov., 1931. 50 cents.

"Eating for Good Looks," by H. R. Cades. *American Girl*, New York: Nov., 1931. 20 cents.

"How Long Will I Live?" by H. S. Cumming, M.D. *New York Herald-Tribune Magazine*. Nov. 1, 1931.

"Mental Hygiene in the Home." *Ladies' Home Journal*. Oct., 1931.

"New Styles in Diet As Well As in Dress," by E. F. Barnard. *New York Times Magazine*. Nov. 1, 1931.

MOUTH HYGIENE

Blazing a New Trail Through the Rockies. Canadian Dental Hygiene Council, Medical Arts Bldg., Toronto. Reports in some detail campaigns in British Columbia, Quebec and Manitoba.

"Educational Program on Dentistry for Children in Michigan," by W. R. Davis; "The Iowa Plan for Dental Health Education," by T. A. Gardner. *Journal of Amer. Dental Assn.*, 212 East Superior St., Chicago. Oct., 1931.

Healthy Teeth. 3 pages of mimeographed copy from League of Red Cross Societies, 2, Avenue Velasquez, Paris, VIII, France.

Suggestions for the Promotion of Mouth Health in Schools, by Bureau of Mouth Hygiene, Michigan Dept. of Health, Lansing. (No date.) 5 p. mimeographed; illustrated. *Free samples to health workers.*

The valedictory issue of *Missouri Public Health News* (Sept., 1931), Jefferson City, was a valuable special mouth hygiene edition.

MOTION PICTURES

The Canadian Tuberculosis Association, through the coöperation of the Dominion Motion Picture Bureau,

is assembling 16 mm. films of all new additions to Canada's tuberculosis sanatoriums together with black and white plans of one ward-floor in each building. The association hopes in this way to bring to the attention of sanatorium boards and others the advances being made in the construction of these new buildings.

"Why Willie Was Willing to Wash," National Motion Pictures Co., Indianapolis. 16 mm. and 35 mm. 1,000 feet. Disease dangers of dirt vs. cleanliness and soap.

"Golden Health." 1,000 feet. 16 mm. and 35 mm. Orange industry and "health-giving qualities." Address upon request.

"The kindest cut of all" (how to cut and edit an amateur movie); "Little touches" (details which create symbolism and picture-telling); "The title is dead; long live the title!" (in the amateur production); "Perfecting projecting" (how to show pictures better); these and other articles in October and November, 1931, issues of *Movie Mak-*

ers, 105 W. 40th St., New York. *Sample free.*

If you wish to locate amateur movie clubs in your city write to Arthur L. Gale, Amateur Cinema League, 105 W. 40th St., New York.

Arranging for a demonstration of the new superspeed film would provide a good excuse for getting together local amateur movie people connected with health and social welfare agencies, with others who might become interested in pictures for those organizations. The demonstration could include explanations of the new possibilities for taking indoor pictures.

POLIOMYELITIS

"Infantile Paralysis," by T. P. Gittens. *Monthly Bulletin*, Philadelphia Dept. of Public Health. Sept., 1931.

"Paralysis Immunity Gains—Adults Resist Infection," by Dr. Simon Flexner. *Health News*, New York State Dept. of Health. Sept. 14, 1931. Also, *New York Times*. Aug. 30, 1931.

READY-MADE NOVELTIES

If you want ready-made illustrations for holiday or seasonal issues of your bulletin or for other printed matter, costing from \$1.00 to \$3.50, the editor will supply addresses.

If ever, in a campaign, you wish to use door hangers, attractive cards to hang on door knobs, the editor of this department will supply you with an address for two-color blanks.

If you wish your Christmas cards to bear a really truly "Santa Claus" postmark write for address of one who will mail them—Santa Claus, Indianapolis.

If you want ideas for putting the holidays into your bulletin look up this department in the March, 1931, issue.

BOOKS AND REPORTS

Typhoid Fever. Its Nature, Mode of Spreading, and Prevention—By William Budd. *New York: American Public Health Association, 1931.* 200 pp. Price, De luxe ed., \$10.00; Reg. ed., \$5.00.

To attempt a critical review of a medical classic such as that before us would be a work of supererogation and smack of impudence. *It is sufficient to call attention to the fact that Budd was the first to recognize clearly the contagiousness of typhoid fever, the danger of polluted sewage and defective sewerage.*

This book was written some 8 years before the discovery of the germ of typhoid fever and 10 years before its isolation on solid culture media. The author was the first to point out the danger of disposing of typhoid fever discharges in such a manner that they could reach drinking water, and characterized it as criminal.

One sentence, with which he closes his summary, is of itself enough to make him immortal: "And he that was never yet connected with his poorer neighbour, by deeds of charity or love, may one day find, when it is too late, that he is connected with him by a bond which may bring them both, at once, to a common grave." Though he wrote this with particular reference to typhoid fever, it is applicable to all contagious diseases. We wish that this could be memorized by all medical students and social workers.

The present volume is published by the American Public Health Association for Delta Omega as the first of a series of reprints of public health classics. The text follows the original publication of 1874, with the exception of three errata noted by the publisher of the

original edition. "There have been printed from type by the George Grady Press, New York, eight hundred copies of this book, the first thirty-five of which have been printed on hand-made paper, numbered and bound in Persian Leather."

It is hard to speak too highly of this work, beautifully and interestingly written, and containing a wealth of facts gained by an epidemiological study which might well serve as a model to modern day workers. It deserves a place in all medical libraries. The original illustrations, one of them in colors, have been reproduced. The printing and make-up are exceptionally good, as befits the character of the text.

MAZÛCK P. RAVENEL

Nineteenth Annual Report of the International Association of Dairy and Milk Inspectors.

This, the 19th annual report of the association, includes the constitution, by-laws, program of the 19th annual convention, reports of committees, and papers read at the convention which was held in Cleveland, O., October 22-24, 1930.

Many important and interesting papers were read on bacteriological and laboratory studies and procedure; milk plant studies, including pasteurization time and temperature; inspection of milk plants; cleansing and sterilization of milk equipment; flavors in milk; milk content from farm to table; co-operation problems between inspectors and plants; and opportunities in the dairy industry. Others included one on a survey of the New York State milk and cream supply, one on undulant fever, and a report on such activities of

ceive new treatment; and the subject of selection is simplified.

Professor Castle's treatise on *Genetics of Domestic Rabbits* is of exceptional interest to laboratory workers who depend on these animals so widely for experimental use. Color and weight are both heritable characters and are significant as to laboratory usefulness and costs of maintenance respectively. Weight of the adult varies from 3 lb. in the Polish breed to 15 in the Flemish Giants. The genetic constitutions of about 58 genotypes designated as types or breeds by breeders, belonging to 11 major phenotypes, are tabulated and discussed in detail.

C. A. KORON

International Health Year Book, 1929—Published by the League of Nations, Distributed in the United States by the World Peace Foundation, 40 Mt. Vernon Street, Boston, 1930. 1504 pp. Price, \$8.00.

This is the fifth edition of the *Year Book*. It contains extensive vital statistics and deals with the public health progress of 40 countries and colonies during the year 1928.

Extensive tables present fundamental statistics for the various countries on area, population, movement of population, birth rates, mortality, causes of death, infant mortality, etc. Developments in the campaign against acute and chronic diseases are discussed as well as special public health activities such as training, child hygiene, water supply, waste disposal, sickness insurance, and rural health service. There is a discussion of public health legislation and budget for each country, and for certain nations general statements are presented concerning developments in the field of curative medicine, covering such topics as hospitals, dispensaries, pharmacies, medical personnel and the cost of medical care.

It is obviously impossible to secure data on all topics from every country

but the volume presents an excellent comparative summary with the more important health facts and activities of the various countries for the year in question.

C. E. TURNER

Jungles Preferred—By Janet Miller. Boston and New York: Houghton Mifflin, 1931. 321 pp. Price, \$3.50.

This is a fascinating story of a woman physician who after serving in Japan and China was asked to go to Belgian Congo. Although she is described as a "little brown sparrow of a woman," she underwent hardships which would have tried strong men.

Even as a book of travel and exploration it is fascinating, but from the medical standpoint, it gives an insight into the superstitions, unhygienic practices, and diseases of the Dark Continent, as well as their treatment and the results.

Dr. Miller has a keen sense of humor as well as a broad love for her fellow beings, which makes the book delightful. It can be highly commended not only to pass pleasant hours, but also for its wealth of information of that part of the world which is too little known, but filled with mystery and romance, and fast coming to be of enormous commercial importance.

MAZÛCK P. RAVENEL

The Mouth Health Quarterly, Vol. I, No. 1. Minneapolis: The American Mouth Health Association, October, 1931.

The growing recognition of the importance of oral hygiene is evidenced by the appearance of a new journal, *The Mouth Health Quarterly*, published by the American Mouth Health Association, with headquarters in the Essex Building, Minneapolis, Minn.

The first number contains a number of excellent articles by doctors, dentists, nurses, and students of nutrition. It is attractively gotten up and beautifully printed.

MAZÛCK P. RAVENEL

A Text Book of Medical Diseases for Nurses—By Arthur A. Stevens, M.D., and Florence Anna Ambler, B.S., R.N. Philadelphia: Saunders, 1931. 503 pp. Price, \$2.75

In this latest contribution to the field of medical nursing, we have not only an interesting and readable book, but a complete, clear and concise presentation of the medical aspect of disease. The subdivisions of chapters are captioned—Definition, Etiology, Symptoms, Pathology, Complications, Prognosis and Treatment, in logical sequence.

Complementing this able discussion of disease, Miss Ambler in simple and direct phraseology describes in detail the nursing care of the patient.

It is this combination of the medical aspect of the disease with the latest and most approved method of nursing care, which makes this a valuable text for the student in the school of nursing.

To the graduate nurse, who has not recently had opportunity for a refresher course, this book is recommended. For her the matter of the appendix which describes the nursing procedures used in the Philadelphia General Hospital will be of interest and value.

This book covers a broad field and leaves little to be recommended other than the addition of more illustration and graphs.

MARY W. J. W.

BOOKS RECEIVED

A TEXT-BOOK OF ORAL PATHOLOGY FOR STUDENTS AND PRACTITIONERS OF DENTISTRY By Russell W. Bunting. Philadelphia: Lea & Febiger, 1929. 495 pp. Price, \$7.00

GYNECOLOGY AND UGEOLOGY FOR NURSES By Samuel S. Rosenfeld. New York: Wood, 1931. 230 pp. Price, \$2.00.

SOCIAL POLITICS AND MODERN DEMOCRACIES By Charles W. Pipkin. New York: Macmillan, 1931. Two Vols. Price, \$7.50

A SYSTEM OF BACTERIOLOGY IN RELATION TO MEDICINE. Vols VI and IX. London: His Majesty's Stationary Office, 1931. Price, Each \$6.00.

HEALTH THROUGH LEISURE-TIME RECREATION By Edith M. Gates. New York: The Woman's Press, 1931. 216 pp. Price, \$2.50

CANCER AND RACE. By Maurice Sorsby. New York: Wood, 1931. 129 pp. Price, \$1.00.

AN INTRODUCTION TO MATERIA MEDICA. Drugs and Solutions. 3d ed. By Stella Goostrey. New York: Macmillan, 1931. 214 pp. Price, \$1.75.

SCHOOL VENTILATION. PRINCIPLES AND PRACTICES. New York: Commission of Ventilation. New York: Teachers College, 1931. 73 pp. Price, \$1.00

SCHOOL NURSING—A CONTRIBUTION TO HEALTH EDUCATION. By Mary Ella Chayer. New York: Putnam, 1931. 292 pp. Price, \$2.50

MARKET MUSIC. 2d ed. By Ernest Kell, and Clarence E. Clement. New York: Wiley, 1931. 455 pp. Price, \$4.50

THE NURSES' MEDICAL LEXICON. By Thomas Lathrop Steadman. New York: Wood, 1931. 679 pp. Price, \$1.75

LESSONS IN MATHEMATICS. By Frederick M. Harrell. New York: Association Press, 1931. 308 pp.

PREFATION OF SCIENTIFIC AND TECHNICAL PAPER. By Sam F. Treloar & Emma Susetta Yule. Baltimore: Williams & Wilkins, 1930. 117 pp. Price, \$1.50

NOISE AND VIBRATION ENGINEERING. By Stephen E. Stearns. New York: Van Nostrand, 1931. 171 pp. Price, \$2.75

THE CONQUEST OF OLD AGE. By Peter Schmidt. New York: Dutton, 1931. 397 pp. Price, \$5.00

PSYCHOLOGY SUBJECT OF SHORT-TIME. By Grace Adams. New York: Cornell-Elmer, 1931. 259 pp. Price, \$2.50

CHILD HEALTH AND THE COMMUNITY. By Courtney Dinsdiddle. New York: Commonwealth Fund, 1931. 80 pp. Price, \$1.75

THE CARE AND FEEDING OF ANIMALS WITH DOUBTS ABOUT CHICKENS. By Louis C. Henderson. New York: Dutton, 1931. 274 pp. Price, \$2.50.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Tuberculosis Relief and Prevention—The amount of relief available to tuberculous families in Syracuse is inadequate, and without effective relief medical care cannot fulfil its possibilities. What relief is given is unrelated to the needs of tuberculosis prevention and good social service. As conditions are much the same the country over, the solution offered may be generally applicable.

BURRIT, B. B. Social Service and the Relief of Tuberculous Families. *Milbank Quart. Bull.*, 9, 4: 147 (Oct.), 1931.

Russian Public Health—Reporting briefly on conditions observed during a short visit, this account by a British medical officer gives every evidence of being dispassionate and true; therefore, it seems a significant contribution.

CRITCHLEY, A. M. Public Health in Russia. *Med. Off.*, 46, 14: 147 (Oct 3), 1931.

Yellow Fever—The last word on the means by which yellow fever is spread and the accepted preventive measures is summarized in this address.

CUMMING, H. S. Present-Day Problems in Yellow Fever. *Pub. Health Rep.*, 46, 40: 2361 (Oct. 2), 1931.

Transmission of Typhus Fever—Evidence is presented pointing to the rat flea as a common vector of endemic typhus from rat to rat and man to man.

DYER, R. E., *et al.* The Experimental Transmission of Endemic Typhus Fever of the United States by the Rat Flea *Xenopsylla Cheopis*. *Pub. Health Rep.*, 46, 42: 2481 (Oct. 16), 1931.

Racial Susceptibility to Communicable Diseases—Significant differences are found in death, case and fatality rates for diphtheria and scarlet fever and measles death rates among several

racial groups under uniform conditions of contact exposure.

EMERSON, H. Significant Differences in Racial Susceptibility to Measles, Diphtheria and Scarlet Fever. *J. Prev. Med.*, 5, 5: 317 (Sept.), 1931.

Mechanisms of Immunity—A series of papers discussing the phenomenon of immunity from the standpoints of tissue resistance, sub-clinical infections, and humoral elements. Although this series is not a formal symposium, the papers, read in succession, constitute an inclusive presentation of this difficult subject.

GAY, F. P., *et al.* Tissue Resistance and Immunities. *J. A. M. A.*, 97, 17: 1193 (Oct. 24), 1931.

Nutrition and Puerperal Infection—Every second woman in an out-patient prenatal group was given an extra supply of vitamins A and D. These women had a greatly reduced incidence of puerperal sepsis over the control group.

GREEN, H. N., *et al.* Diet as a Prophylactic Agent Against Puerperal Sepsis. *Brit. M. J.*, 3691: 595 (Oct. 3), 1931.

Diphtheria Contacts and Carriers—Of 3,449 contacts, 11.7 per cent were found positive. Of those negative at the first test, 13.4 per cent were found positive after 10 days. Many other significant findings are included in this Baltimore study.

KUSAMA, Y., and DOULL, J. A. Carrier Infection Among Family Associates of Diphtheria Patients. *J. Prev. Med.*, 5, 5: 369 (Sept.), 1931.

Computing Maternal Death Rates—What determines the cause of maternal deaths?—the statement of the physician, the registrar, the code of

rules, or the exceptions to the rules? Is there a way of determining rates better than deaths per 1,000 births? In the light of acknowledged disparity, should comparative national rates be computed in tenths of a per cent? Are we justified in comparing selected group experience with the country at large? Here are some provocative questions, the answers to which should be considered by all sanitarians who have regard for the truth.

LOWRIE, R. J. The Maternal Mortality Rate Computed and Standardized by a New Method. *New York State J. Med.*, 31, 19: 1189 (Oct. 1), 1931.

Estimating Nutritional Status—Proposing a width-length factor by which the usual height-weight-age tables can be made more nearly true indices of nutritional status. An important contribution.

LUCAS, W. P., and PRYOR, H. B. Physical Measurements and Physiologic Processes in Young Children. *J. A. M. A.*, 97, 16: 1127 (Oct. 17), 1931.

Cancer Immunity Research—Reporting from London limited but promising studies in immunity against implanted mouse tumors.

LUMSDEN, T. The Problems of Cancer Treatment and Research with Special Reference to Tumor Immunity. *J. State Med.*, 39, 10: 577 (Oct.), 1931.

Heart Disease in Children—This study of San Francisco school children, of whom 2 per cent were reported as cardiac suspects, reveals many interesting conditions. Scarlet fever and diph-

theria are apparent factors causing organic heart disease.

RICHTER, I. M. Incidence and Variety of Heart Disease in School Children of San Francisco. *J. A. M. A.*, 97, 15: 1060 (Oct. 10), 1931.

Applied Sex Hygiene—Excellent indeed is this straightforward account of what a school nurse really can do in the treatment of sex problems. Worth a bushel of vague generalizations on social hygiene.

SMALLEY, R. The School Nurse Meets Social Hygiene Problems. *Pub. Health Nurse*, 23, 10: 475 (Oct.), 1931.

Preventing Diphtheria in Bridgeport—If you read this conclusion you will not be satisfied until you have read the whole paper. "We believe that the immunization treatments are no more important in the reduction of diphtheria in Bridgeport than the three administrative measures listed above (multiple negative release culture, bacteriological examination of every possible contact, selection of most effective culture medium)."

WILD, W. F., and TIRRELL, K. R. Diphtheria Control in Bridgeport, Connecticut. *J. Prev. Med.*, 5, 5: 303 (Sept.), 1931.

Studies in Health Education Results—Can general health education propaganda be made to pay dividends, or would the money and effort be better spent on direct preventive measures? An answer to the question is found in this Bellevue-Yorkville study.

ZIMAND, S. Campaign Calendar of a Public Health Organization. *Milbank Quart. Bull.*, 9, 4: 165 (Oct.), 1931.

NEWS FROM THE FIELD

RECOMMENDATIONS OF THE COMMITTEE
ON EMPLOYMENT PLANS AND SUG-
GESTIONS, CHICAGO, ILL., OCTOBER
26 AND 27, 1931

AMONG the recommendations of
this committee are the following:

RECOMMENDATION NO. 1.—RESUMPTION OF WORK

United National Action to Encourage
Every American Citizen Now Employed
to Resume Normal Buying—To Use
Available Income to Purchase Goods
Normally Needed and in the Replace-
ment of Which Labor is Employed—Is
a Condition Precedent to Any Hopeful
Program to Constructively Increase Em-
ployment; Continued and Further Re-
striction of Consumption of Goods and
of Expenditures for Improvements and
Replacements Inevitably Will Offset
Any and Every Effort for Emergency
Relief.

RECOMMENDATION NO. 4.—SPREAD WORK

The Spreading of Available Work in
Industrial, Commercial, and Professional
Enterprises Still is the Most Fruitful
Field for Immediate Unemployment Re-
lief. Workers Have Generously Shared
Hours of Labor and a Substantial Pro-
portion of Employers Have Given Ear-
nest and Sincere Coöperation, but Abun-
dant Evidence is at Hand that a Large
Number of Employers Have Not Re-
sponded. Therefore, the Committee Re-
news its Recommendations of September
28.

RECOMMENDATION NO. 6.—PUBLIC WORKS

The Committee Urges That Nothing
be Omitted to Make Immediately Avail-

able New Additional Employment Rep-
resented by Public Work Already Au-
thorized and Appropriated for but
Delayed or Blocked by Removable
Legal Obstacles and Supervisory Red
Tape.—The President's Organization on
Unemployment Relief, WALTER S. GIFF-
ORD, *Director*, 1734 New York Avenue,
Washington, D. C.

CANADIAN RESEARCH COUNCIL MEETING POSTPONED

THE Canadian National Research
Council announces that the Fifth
Pacific Science Congress, planned under
the auspices of the Canadian National
Research Council, in Victoria and Van-
couver, British Columbia, between the
dates May 23 and June 4, 1932, has
been postponed for a year.

HYGIENE AND BATHS

THE American Association for Hy-
giene and Baths held its 1931 Con-
vention at the Webster Hall Hotel in
Detroit, Mich., November 6 and 7,
under the auspices of the Detroit De-
partment of Health with the coöperation
of the Michigan State Department of
Health.

JOHN HANCOCK ISSUES NEW BOOKLET

THE great variety of functions
through which the modern city
health department prevents the spread
of disease and promotes the health of
the people it serves are set forth in a
new booklet, *Your Friend, the Health
Officer*, issued by the Life Conservation
Service of the John Hancock Mutual
Life Insurance Company, Boston, Mass.
This contribution to the support of the
modern health program was written by

Dr. Wilson G. Smillie, Professor of Public Health Administration, Harvard University Medical School.

This new booklet is available for immediate distribution to health officials.

SEWAGE WORKS ASSOCIATION MEETING

THE fall meeting of the New York State Sewage Works Association was held at Ithaca, N. Y., October 16-17, President J. F. Skinner presiding. The total registration of members and guests was 96. Among the papers presented were—Sedimentation Tank Design and Performance, by Glenn D. Holmes, and a Symposium on Stream Pollution, participated in by Professors Chamot, Needham, and Classen, of Cornell University, and Dr. Emmeline Moore, of the New York State Conservation Department.

TEXAS PUBLIC HEALTH ASSOCIATION MEETING

THE Texas Public Health Association held its annual meeting in Houston, November 9-13. Dr. A. C. Hutcheson, City Health Officer, and Dr. H. K. Read, president of the Association, Houston, were joint directors of

the meeting. There were two days of laboratory work, one day devoted to round table discussions of the Texas drought relief health program, malaria control, and county unit work. One evening session featured unemployment relief measures, and two days were devoted to various public health problems.

PSYCHIATRY

A NEW Division of Psychiatric Education has been created in the office of The National Committee for Mental Hygiene, with the aid of The Commonwealth Fund, The New York Foundation, and The American Foundation for Mental Hygiene, all of which have contributed to the support of the project.

The Division is under the immediate direction of Dr. Ralph A. Noble, of Sydney, Australia, who has a wide knowledge of psychiatric education in Europe and America and was invited to this country to inaugurate the work of the new Division and to take active charge of the program; and associated with him is Dr. Franklin G. Ebaugh, Director of the Colorado State Psychopathic Hospital, who is familiar with psychiatric training problems in this country and has given the subject special study.

PERSONALS

DR. CHARLES WARDELL STILES was retired from active duty in the U. S. Public Health Service on October 1, after more than 40 years of service in the government. Dr. Stiles' many friends took this occasion to extend to him a dinner, which was held at the Cosmos Club, November 7.

DR. L. D. BRISTOL, Member A. P. H. A., of New York, Health Director of the American Telephone and Telegraph Company, has contributed the Chapter on Health in the *Handbook on Business Management*, recently

published for the American Management Association.

MAJOR G. C. DUNHAM, formerly of the Medical Field Service, U. S. Army, Carlisle Barracks, Carlisle, Pa., is now located in the Office of the Governor General, Philippine Islands, Manila.

DR. A. JUDSON KEMPER has been appointed Health Officer of Harrison County, W. Va., to succeed Dr. V. A. Selby, Member A. P. H. A., retired.

DR. R. S. PATTERSON has been appointed representative of Public

Health Education Section on the A. P. H. A. nominating committee.

EDWARD F. BROWN resigned as executive of New York's Diphtheria Prevention Commission, thus closing the 3-year program which reduced cases about 56 per cent and death rate about 30 per cent.

HORACE HUGHES is now in New York as administrative assistant, Tuberculosis and Health Committee, State Charities Aid Assn., with special reference to health education and publicity.

JOHN W. KELLY is director of health education, Kentucky State Board of Health.

HARRIET L. PARSONS has become educational assistant, Massachusetts Society for Mental Hygiene.

CONFERENCES

January 22-23, American Social Hygiene Association, New York, N. Y.

April 4-8, American College of Physicians, San Francisco, Calif.

April 11-15, American Nurses Association, San Antonio, Tex.

April 11-15, National Organization for Public Health Nursing, San Antonio, Tex.

June 6-9, National Tuberculosis Association, Colorado Springs, Colo.

July, The Second International Conference of Social Work, Frankfurt, Germany.

September 6-9, Annual Meeting of the International Union Against Tuberculosis, The Hague, Holland.

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B-K is a standardized sodium hypochlorite solution in a concentrated form . . . B-K has a quick-acting, germ-killing power, many times more powerful than carbolic acid . . . B-K is soluble in water and as efficiently active in cold water as in warm water . . . B-K is clear and free from oil, acids and poisons . . . and harmless to equipment and human tissues. B-K is dependable—easy to get—easy to use—and very economical. Leading organizations of public health recommend B-K as a highly effective sterilizer of dishes, glasses and silverware in public eating and drinking places.

Interesting data will be sent on request.

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